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A Quiet Iron Market

No Cut in the Price of Standard Rails

The Steel Corporation's Statement of Unfilled Orders July 30

Iron and steel markets have probably not been quieter this year than in the past week. Crop news has been favorable on the whole and has helped sentiment, but it is evident that something more stirring in outside developments will be required to quicken the iron trade into real activity.

The statement of unfilled orders on the books of the United States Steel Corporation subsidiaries, given out as this is written, shows a total of 3,970,931 tons July 30, against 4,257,794 tons June 30, a falling off in the month of 286,863 tons. The falling off in the second quarter, as reported in July, was 1,144,720 tons, or an average of 381,570 tons a month. It is to be considered that production has been reduced in July, and therefore the July 30 statement of unfilled orders does not permit any exact deduction as to the inflow of new business last month, as compared with the three preceding months. It is well known, however, as was indicated a week ago, that July showed some decrease both in new orders and in shipments from the average for June.

The policy of the railroads, as to a large extent it is that of all consumers, is to buy for early needs. A few conspicuous exceptions come up, including the definite inquiry for 3000 cars for the Chicago & Alton and the statement that the New York Central Lines will place orders for 265 locomotives.

Much has been published in the past week of an alleged cut of \$1.50 in the price of steel rails. It can be said on authority that no reduction from the \$28 basis for standard rails has been made, nor is any change contemplated. Some statements have intimated that the cut was made on Mexican business. It is a fact that a large Mexican order is pending and it is also well known that the \$28 price has not been maintained on export trade.

Structural works find that while large projects which require special financing are dormant there is a good aggregate, particularly in the West, of steel construction involving moderate tonnages. A dozen railroads are asking for bridge steel in small lots ranging up to 500 tons, indicating that nothing is being placed that can be postponed.

Steel car works are supplied with orders that will carry them into October, so that plate shipments for that trade have not shrunk greatly.

The vote of the Amalgamated Association on the proposal to call off the strike in American Sheet & Tin Plate Company mills showed 63.2 per cent. adverse. Had the strike been ended the Martins Ferry and La

Belle tin plate plants would have started and the Aetna Standard sheet mill. On tin plates the company is sold into February at its present rate of output and is three months behind in deliveries.

In cast iron water pipe the most important contract is for 3400 tons for Cheyenne, Wyo., taken by the largest producer. The low price of \$21.89 on 500 tons let at Boston indicates an unusual anxiety for business. A gas pipe contract soon to come up is for a line 80 miles long, from Fayette, Miss., to Birmingham, Ala.

All pig iron markets are dull. The feeling is spreading that prices recently named are calculated to attract buyers. The level for which certain pipe foundries have been waiting has now been reached and some business has resulted.

Northern Ohio has finished the only round transaction in steel making iron. Of 10,000 tons of basic inquired for, 5000 tons was bought for fourth quarter delivery, the price netting the furnace about \$14.

The July movement of Lake Superior ore by water was 6,945,000 tons, or 371,000 tons less than in June. Shippers are already counting on an early closing of the season, owing to the now certain shrinkage of requirements.

There has been sufficient buying of copper this week, in conjunction with the evidences of curtailment, to establish the price of electrolytic at 12.62½c., while Lake has advanced to 13c. After the wearying succession of disappointments in the industry, a more hopeful view of the outlook is finding less resistance.

Pig Iron Stock Statistics and Their Value

When the iron trade is most concerned about knowing at what rate iron and steel are being consumed by the country the difficulties of finding out are usually greatest. The present is one of the times of special interest and difficulty. Since the publication of the blast furnace statistics last week, the statement has been made in several pig iron market reviews that the reduction of output in July has evidently established a close relation between supply and demand, and that the further reduction promised should bring improvement to the pig iron market. At the same time regret has been expressed that the statistics of pig iron stocks in the hands of producers are no longer published, the idea being, no doubt, that such publication would furnish the key to the situation. In the financial column of a recent issue of the *New York Evening Post* this appeared:

We are told that, on the basis of the July output, the country's rate of annual production is 20 per cent. less than what it was at the maximum of the present year. But this is in some ways an extremely misleading comparison. There was no one at all in touch with conditions in the iron trade who was not aware last February that overproduction on a formidable scale was under way. To rectify this unwholesome position in the iron trade was as necessary as to rectify the position on the Stock Exchange, and that work has been largely accomplished. It would greatly reassure the trade if it could be known how far the huge accumulations of unsold iron have been reduced since February. But the iron trade refused, shortly after the large combinations in the industry, to give out those figures any longer. It did not like to have all the world know when supply and demand were out of touch. But, of course, the penalty comes when the trade would have good news to give out in the same direction, but cannot do it.

What was said in these columns last week of the difference between the present rate of pig iron production and the maximum rate of 1910 only becomes mis-

leading when used as if it had to do with consumption. It is common to see the pig iron production statistics headlined as favorable when they show a large output and unfavorable when output declines. But it would be hard for any one who had followed the course of the iron trade this year to make a wrong deduction from the figures of August 1. The trade had been calling for curtailment, and plainly curtailment was under way at last to an extent that meant a shorter cut to equilibrium than the figures of June 1, two months previous, which showed but 10 per cent. reduction from the high rate of February.

A word as to the main matter with which this extract deals—the statistics of stocks of pig iron in makers' hands: They are not so valuable as they are made to appear. When these statistics were first gathered, merchant pig iron was much more than half the country's output. Steel companies were regular buyers of pig iron. To-day the steel companies produce more than twice as much pig iron as the merchant furnaces and only buy from the latter on booms. Figures of stocks in merchant makers' hands are now of less significance, as bearing on the general iron and steel situation, than the figures of stocks at steel works furnaces, which were never collected even in the days of publicity.

The stock statistics published regularly up to the fall of 1905 related chiefly to foundry iron and to the smaller amount of steel making iron produced by merchant furnaces. They were discontinued because some of the furnace companies considered that the holding off by foundry buyers in the first six or eight months of 1905 was due to the monthly announcement of an increase in furnace stocks. The theory of the refusing companies was that secrecy about stocks would result in the buyer coming into the market from time to time and possibly prevent the weakening of prices, which had accompanied the general knowledge of large accumulations of iron.

The suppression of data on stocks has had very little, if any, effect on the pig iron trade. Since 1905 the steel companies have had less and less to do with the pig iron market. The furnaces producing foundry iron have also learned that stocks in their customers' hands may at times signify much more than stocks on furnace banks. These foundry stocks led to an exaggerated notion of the rate of consumption in the fall of 1909. All the iron bought on the revival of demand last August was taken into foundry yards, for on a rising market full contract deliveries are wanted whether the iron is needed or not. The same was true of steel products. All over the country, following two years of hand-to-mouth buying and cleaning up of stocks, the second half of 1909 brought a general restocking movement. Just what the actual consumption of iron and steel products was then would be as hard to determine as it is to-day. Then iron and steel were accumulating in consumers' hands and consumption was less than it seemed to be. In recent months, as users of iron and steel have worked off their high priced stocks, consumption has probably been underestimated.

It is hard to say how the publication of pig iron stocks, month by month since the opening of this year, would have changed the attitude of foundry iron buyers. So many signals have been flying that the consumer has not been left in doubt, even though a greater

factor than furnace stocks—the total of pig iron stocks at foundries—has been, as always, a matter of conjecture. The steadily lowering prices quoted by individual sellers, who presumably found stocks growing on their hands, have told their own story. Having bought freely in the upward movement of 1909 without any information from stock statistics, the discerning foundryman has apparently picked his way along the declivity of 1910 without their help.

In times when the adjustments of supply and demand are more delicate than they have been in the movement of 1909 and its counterpart of 1910, pig iron stock statistics have a certain value. But for the reasons given, and with the great swing of the industry toward steel produced by strong, self-contained companies, that value is much less than it has ever been.

Contraction in Lake Ore Shipments

The July movement of Lake Superior iron ore, amounting to 6,945,000 tons, against 7,316,000 tons in June, marks the beginning of curtailment there, following six months of declining pig iron production. Before they had unloaded in their storage yards the first trainload of 1910 ore some of the Central Western blast furnace companies saw that their purchases for the year ending April 30, 1911, would be far in excess of their needs. Moreover, the argument commonly put forth early in the year that as ore cost had advanced the pig iron market would have just that much less room in which to fall has been swept away by events. The suggestion of a readjustment of ore prices did not appeal to the ore producers, who saw in such a procedure the possibilities of fresh demoralization in pig iron. As the shipping season advanced, rail freights from lower lake docks on ore that must stay on furnace yard stockpile many months before it could be worked up became more of a burden. There would be some relief if it could be held on dock at Lake Erie, even though the rebate for direct shipment were sacrificed. Ordinarily the consumer's request to have ore docked would be granted, within limits. But as ore shipments per year have been passing the 40,000,000-ton mark dock space has not grown greatly, furnace storage being depended on to care for the increase. Thus with crowded docks and the desire of furnaces to have ore held back the question comes up of the extent to which shipping programmes can be revised and the ore held at the mine.

Reselling part of his ore at a sacrifice will not appeal to the average furnaceman. To the 50 cents concession, which is the basis named in a recent offer, there is the offset of a saving in interest—about half as much on \$5 ore—and the possibility of loss on pig iron should present tendencies continue. But the chief reason for expecting few resales is that there are practically no buyers—nearly all have enough and more.

With 21,863,000 tons of ore moved up to August 1, or nearly 6,500,000 tons more than to the corresponding date in 1909, it is plain that there can be even a further laying off of ore freighters and have enough ore down by December 1 to last into the summer of 1911. While it has been evident for months that the 50,000,000-ton movement talked of at the beginning of the year was improbable, there are still indications that the record shipments of 42,500,000 tons in 1909 will be exceeded.

The Revision of Iron and Steel Duties

Iron and steel manufacturers feel that the criticisms of the revision of the tariff effected by the Payne act of 1909 are ill founded as far as the metal schedule is concerned. Those who claim that there was no revision downward, and that in this respect the campaign promises of the dominant political party in 1908 were not fulfilled, should take a little time to make a comparison of the duties imposed by the metal schedule of the Dingley act with those fixed by the act now in force.

If such an examination were to be made, it would be found that the duty on steel rails was reduced from \$7.84 to \$3.92 per ton, or 50 per cent.; the duty on wrought pipes or tubes was reduced from 2 cents to 1 cent per pound, or 50 per cent.; the duty on bar iron was reduced from 6-10 to 3-10 cent. per pound, or 50 per cent.; the duty on structural shapes was reduced from 5-10 to 3-10 cent per pound, or 40 per cent.; the duty on pig iron was reduced from \$4 to \$2.50 per ton, or 37½ per cent.; the duty on anchors was reduced from 1½ cents to 1 cent per pound, or 33 1-3 per cent.; the duty on hoops and bands was reduced from 5-10 to 3-10 cent per pound, or 40 per cent.; the duty on planished sheets was reduced from 2 to 1½ cents per pound, or 25 per cent.; the duty on black sheets, from Nos. 25 to 32, was reduced from 1 1-10 cents to 8-10 cent per pound, or 27 3-10 per cent.; the duty on galvanized sheets, from Nos. 25 to 32, was reduced from 1 3-10 cents to 1 cent per pound, or 23 1-13 per cent.; the duty on tin plates was reduced from 1½ to 1 1-5 cents per pound, or 20 per cent.; the duty on steel plates, valued from 1 cent to 2 cents per pound, was reduced from 6-10 to 5-10 cent per pound, or 16 2-3 per cent. The duties on a great variety of other iron and steel articles were reduced from 25 to 33 1-3 per cent. The duty on scrap iron was reduced from \$4 to \$1 per ton, or 75 per cent. The duty on iron ore was reduced from 40 to 15 cents per ton, or 62½ per cent.

It will be well to keep these reductions in duty in mind in the heated discussion which is now being conducted in some quarters relative to the necessity for another tariff revision. It is possible that in some schedules the reductions made were not such as to accomplish much saving in the duties imposed, but this has clearly not been the case with the metal schedule.

A Suggestive Noncancellation Clause

The Brown & Sharpe Mfg. Company, Providence, R. I., has placed at the foot of its quotation sheet to customers the paragraph: "Cancellation of orders once placed with and accepted by us can be made only with our consent." The clause is suggestive to those who are studying the details of a new practice—for the machine tool trade—of noncancellation of contracts. It does not voice a hard and fast rule, but places the manufacturer in a position from which he can dictate terms when the occasion shall arise. At present the customer is the dictator. At times of business crises the machine builder is protected by such a clause. He can deal individually with his customers. The optimistic buyer, who orders too heavily on the principle that when business is rushing he can have none too great a producing power, is made to realize that he and not the manufacturer of machinery must bear the burden of a slump.

The Machinists' Strike on the Pacific Coast

Reports from members of the United Metal Trades Association of the Pacific Coast indicate that in the last week in July greater gains were made in their working forces than in any week since the machinists' strike was declared. In Seattle more machinists were at work than on June 1. Business is reported better than at the time the strike was called, and while some of the shops need more men none is seriously handicapped. It is stated that if only the same amount of work required to be done that was going through the shops two months ago, all would have full forces. At Spokane conditions are gradually becoming normal, and all shops are running with good forces. At a meeting of the employers a formal declaration for the open shop was adopted. Portland shops report that pickets are becoming less numerous. At Tacoma some further additions have been made to the working forces. Retail merchants at Portland have gone on record for the open shop. The labor unions there are threatening to call a general strike to force the draymen to yield to the teamsters. At Los Angeles the City Council passed an ordinance which prohibits the carrying of boycotting banners and the use of other methods, such as public outcry, to prevent persons from entering places of business or factories. A similar ordinance was passed at Portland.

An interesting development is the friction between labor union leaders that has resulted from the failure of the molders and patternmakers to go out in support of the machinists' strike. A letter from President O'Connell of the International Association of Machinists to President Valentine of the Iron Molders' Union, says that he feels very keenly the failure of the iron molders to co-operate. "I find myself," he says, "in a most awkward position trying to explain to our people why it is that only the machinists on the Puget Sound are now struggling to extend the eight-hour day, and that the molders and patternmakers are taking no part with us." He adds that if the machinists are left alone to fight it out, the contest will be long drawn out and expensive, with the outcome very doubtful.

Foundry Machinery and Supply Firms Incorporated

At a meeting of the Executive Committee of the Foundry and Manufacturers' Supply Association, held at the Hollenden Hotel, Cleveland, August 8, the committee appointed to investigate the feasibility of incorporating the organization in accordance with the resolution passed at the annual meeting held in Detroit, presented the following report:

Since the convention in Detroit, we find that the molding machine manufacturers and others, representing one-third of the space at the exhibit held in Detroit, have incorporated under the laws of the State of Pennsylvania as the Foundry and Machine Exhibition Company, with a capital of \$25,000. After investigation, we find the purposes and intentions of this incorporation are identical with the object of the organization which your association proposed. Therefore, if after full and complete information concerning this corporation is submitted to the members, and if the same be found satisfactory to them, we recommend that the members of the Foundry and Manufacturers' Supply Association join the new corporation.

The committee appointed to investigate the incorporation of this society appointed by George R. Rayner, president-elect, consists of S. T. Johnston, S. Obermayer Company, Chicago; Frederick B. Stevens, Detroit, and F. N. Perkins, Arcade Mfg. Company, Freeport, Ill. Secretary C. E. Hoyt was instructed to advise the members of the association immediately of the committee's report, and a more complete statement will be issued by the Executive Committee in the near future. The report was presented by the committee to

President-elect Rayner, by whom it was referred to the Executive Committee and was favorably acted upon.

The Eastern Scrap Situation

A communication has been addressed to railroad companies by a large scrap dealer on the subject of the concentration of purchases of scrap through one agency by a number of eastern Pennsylvania steel manufacturers and bar iron rolling mill companies. It presents the views of the dealers, who have found their business seriously disorganized by this method of syndicate buying, which they believe works an injustice to the railroads, who furnish the principal supply of scrap, as well as to themselves. The communication is as follows:

A combination in restraint of trade is one which makes it possible for that combination to sell its product to the consumer at a higher price than the members could otherwise get if not in combination, or else makes it possible for that combination to buy material which its members use at a lower price than they could otherwise buy the material if not in combination.

The associated mills of the East are buying all their scrap iron through one broker. The railroads could break this up and get a higher price for their scrap if they would refuse to sell to his broker, or refuse to sell material to those mills through this broker. The railroads should agree to foster competition in the scrap iron trade, not destroy it.

Without the scrap man, who is the middleman and the balance wheel, as it were, in the business, the railroads would be getting less money all the time for their scrap material, and in the end all competition would be destroyed and they would be at the mercy of the mills, who would buy the scrap at less than it is worth.

Scrap iron and steel have always sold at a higher price in eastern Pennsylvania, by \$1 to \$2 per ton, than in western Pennsylvania. To-day, through the efforts of the brokers working for the combination, prices are \$1 to \$2 per ton lower in eastern Pennsylvania than in western Pennsylvania.

The scrap dealer who writes the communication says he is ready to retire from the business if he is not assured of the co-operation of the railroads in developing competition among the dealers instead of eliminating such competition.

A. M. Byers Company Improvements.—This company is now going ahead with the improvements at its South Side Pittsburgh plant, the cost of which will aggregate \$225,000. The Riter-Conley Mfg. Company, Pittsburgh, has contracts for the steel buildings, which include pipe mills, gas producer, conveyor building, warehouses and covered crane runways for storage purposes, besides a brick boiler house. These improvements, which will be completed early next year, will give the A. M. Byers Company an increased capacity in its pipe department. The construction of the 46 puddling furnaces at the Girard, Ohio, plant is progressing favorably and it is expected that they will be ready for operation in the latter part of October.

The Colonial Steel Company, Pittsburgh, with plant at Colona, Pa., will shortly erect a new steel and brick warehouse, 72 x 117 ft., equipped with a 5-ton electric traveling crane and having a runway extension 200 ft. long with 63-ft. span, on which a somewhat larger crane will be operated for yard storage. S. Diescher & Sons, engineers, Farmers Bank Building, Pittsburgh, are taking bids for the building and equipment.

The Sharon Foundry Company, Sharon, Pa., with plant at Wheatland, nearby, manufacturer of steel castings, has let a contract to Wallis & Carley for the erection of an addition to its pattern storage house which will be 50 x 60 ft., of iron and wood construction, with slate roof. No additional equipment will be required.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Month in Heavy Type,
Declines in Italics.

At date, one week, one month and one year previous.

Aug. 10, 1910.	Aug. 3, 1910.	July 13, 1910.	Aug. 11, 1909.
PIG IRON, Per Gross Ton:			
Foundry No. 2, standard, Philadelphia.....	\$16.00	\$16.00	\$16.25
Foundry No. 2, Southern, Cincinnati.....	14.25	14.50	14.75
Foundry No. 2, local, Chicago.....	16.50	16.50	16.50
Basic, delivered, eastern Pa.....	15.25	15.25	15.75
Basic, Valley furnace.....	14.25	14.25	14.50
Bessemer, Pittsburgh.....	16.17	16.15	16.40
Gray forge, Pittsburgh.....	14.40	14.40	14.40
Lake Superior charcoal, Chicago	18.50	18.50	18.50

BILLETS, &c., Per Gross Ton:			
Bessemer billets, Pittsburgh.....	24.50	24.50	25.00
Forging billets, Pittsburgh.....	30.00	30.00	30.00
Open hearth billets, Philadelphia	27.50	27.50	28.50
Wire rods, Pittsburgh.....	28.00	28.50	29.00
Steel rails, heavy, at mill.....	28.00	28.00	28.00

OLD MATERIAL, Per Gross Ton:			
Steel rails, melting, Chicago.....	13.50	13.50	13.00
Steel rails, melting, Philadelphia	13.75	13.75	14.25
Iron rails, Chicago.....	16.50	16.50	16.75
Iron rails, Philadelphia.....	18.00	18.00	19.00
Car wheels, Chicago.....	14.50	14.50	14.75
Car wheels, Philadelphia.....	14.00	14.00	14.50
Heavy steel scrap, Pittsburgh.....	14.25	14.50	14.50
Heavy steel scrap, Chicago.....	12.25	12.25	12.25
Heavy steel scrap, Philadelphia.	13.75	13.75	14.25

FINISHED IRON AND STEEL,			
Per Pound:	Cents.	Cents.	Cents.
Refined iron bars, Philadelphia.	1.42½	1.42½	1.47½
Common iron bars, Chicago.....	1.40	1.40	1.40
Common iron bars, Pittsburgh.....	1.45	1.45	1.50
Steel bars, tidewater, New York	1.56	1.56	1.61
Steel bars, Pittsburgh.....	1.40	1.40	1.45
Tank plates, tidewater, New York.	1.56	1.56	1.56
Tank plates, Pittsburgh.....	1.40	1.40	1.40
Beams, tidewater, New York.....	1.56	1.56	1.56
Beams, Pittsburgh.....	1.40	1.40	1.40
Angles, tidewater, New York.....	1.56	1.56	1.56
Angles, Pittsburgh.....	1.40	1.40	1.40
Skelp, grooved steel, Pittsburgh.	1.50	1.50	1.50
Skelp, sheared steel, Pittsburgh.	1.60	1.60	1.60

SHEETS, NAILS AND WIRE,			
Per Pound:	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.25	2.30
Wire nails, Pittsburgh.....	1.70	1.70	1.80
Cut nails, Pittsburgh.....	1.65	1.65	1.70
Barb wire, galv., Pittsburgh.....	2.00	2.00	2.10

METALS, Per Pound:			
Lake copper, New York.....	13.00	12.75	12.62½
Electrolytic copper, New York..	12.62½	12.50	12.37½
Spelter, New York.....	5.20	5.20	5.20
Spelter, St. Louis.....	5.05	5.05	5.05
Lead, New York.....	4.40	4.40	4.40
Lead, St. Louis.....	4.30	4.25	4.25
Tin, New York.....	33.37	33.20	32.65
Antimony, Hallett, New York...	8.00	8.00	8.12½
Nickel, New York.....	45.00	45.00	45.00
Tin plate, 100 lb., New York...	\$3.84	\$3.84	\$3.84

* These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c. net; I-beams over 15 in., 1.50c. to 1.55c. net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c. net; angles over 6 in., 1.50c. to 1.55c. net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.45c. plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.40c. to 1.45c. net; tees, 3 in. and up, 1.40c. to 1.45c. net; angles, channels and tees, under 3 in., 1.45c. base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.70c. to 1.75c. net;

hand rail tees, 2.50c. net; checkered and corrugated plates, 2.50c. net.

Plates.—Tank plates, ¾ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c. base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼-in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼-in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge.....	\$0.10
Gauges under 3-16-in. to and including No. 8.....	.15
Gauges under No. 8 to and including No. 9.....	.25
Gauges under No. 9 to and including No. 10.....	.30
Gauges under No. 10 to and including No. 12.....	.40
Sketches (including all straight taper plates), 3 ft. and over in length.....	.10
Complete circles, 3 ft. diameter and over.....	.20
Boiler and flange steel.....	.10
"A. B. M. A." and ordinary firebox steel.....	.20
Still bottom steel.....	.30
Marine steel.....	.40
Locomotive firebox steel.....	.50
Widths over 100 in. up to 110 in., inclusive.....	.05
Widths over 110 in. up to 115 in., inclusive.....	.10
Widths over 115 in. up to 120 in., inclusive.....	.15
Widths over 120 in. up to 125 in., inclusive.....	.25
Widths over 125 in. up to 130 in., inclusive.....	.50
Widths over 130 in.....	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive.....	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive.....	.50
Cutting to lengths or diameters under 1 ft.....	1.55
No charge for cutting rectangular plates to lengths 3 ft. and over.	

TERMS.—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows: Black annealed sheets, Nos. 3 to 8, 1.70c.; Nos. 9 and 10, 1.75c.; Nos. 11 and 12, 1.80c.; Nos. 13 and 14, 1.85c.; Nos. 15 and 16, 1.95c. Box annealed sheets, Nos. 17 and 21, 2.05c.; Nos. 22 to 24, 2.10c.; Nos. 25 and 26, 2.15c. to 2.20c.; No. 27, 2.15c. to 2.20c.; No. 28, 2.20c. to 2.25c.; No. 29, 2.25c. to 2.30c.; No. 30, 2.35c. to 2.40c. Galvanized sheets, Nos. 13 and 14, 2.50c.; Nos. 15 and 16, 2.55c.; Nos. 17 to 21, 2.70c.; Nos. 22 to 24, 2.85c.; Nos. 25 and 26, 3c. to 3.05c.; No. 27, 3.10c. to 3.15c.; No. 28, 3.30c. to 3.35c.; No. 29, 3.45c. to 3.50c.; No. 30, 3.65c. to 3.70c. Painted roofing sheets, No. 28, \$1.65 per square. Galvanized roofing sheets, No. 28, \$3 per square, for 2½-in. corrugations.

Wrought Pipe.—The following are the discounts on the Pittsburgh basing card on carloads of wrought pipe now in effect:

	Steel.	Black.	Galv.	Black.	Galv.
¾ and 1 in.....	70	54	66	53	58
1 in.....	71	57	67	53	58
1½ in.....	74	62	70	58	64
2 in.....	78	68	74	64	68
2½ to 3 in.....	72	57	68	53	58
3 to 4 in.....	70	56	72	62	62
4 to 5 in.....	63	51	59	47	54
5 to 6 in.....	70	58	66	54	50
6 to 8 in.....	66	54	62	50	50
8, 10, 11 and 12 in.....	54	42	..	..	..
Double Extra Strong, Plain Ends.	59	48	55	44	44

The above steel pipe discounts are for "card weight," subject to the usual variation of 5 per cent.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1¼ in.....	49	43
1¼ to 2 in.....	61	43
2 to 2½ in.....	63	48
2½ to 3 in.....	69	55
3 to 4 in.....	61	43
4 to 5 in.....	61	43
5 to 6 in.....	61	43
6 to 8 in.....	61	43
8 to 10 in.....	61	43
10 to 12 in.....	61	43
12 to 14 in.....	61	43
14 to 16 in.....	61	43
16 to 18 in.....	61	43
18 to 20 in.....	61	43
20 to 22 in.....	61	43
22 to 24 in.....	61	43
24 to 26 in.....	61	43
26 to 28 in.....	61	43
28 to 30 in.....	61	43
30 to 32 in.....	61	43
32 to 34 in.....	61	43
34 to 36 in.....	61	43
36 to 38 in.....	61	43
38 to 40 in.....	61	43
40 to 42 in.....	61	43
42 to 44 in.....	61	43
44 to 46 in.....	61	43
46 to 48 in.....	61	43
48 to 50 in.....	61	43
50 to 52 in.....	61	43
52 to 54 in.....	61	43
54 to 56 in.....	61	43
56 to 58 in.....	61	43
58 to 60 in.....	61	43
60 to 62 in.....	61	43
62 to 64 in.....	61	43
64 to 66 in.....	61	43
66 to 68 in.....	61	43
68 to 70 in.....	61	43
70 to 72 in.....	61	43
72 to 74 in.....	61	43
74 to 76 in.....	61	43
76 to 78 in.....	61	43
78 to 80 in.....	61	43
80 to 82 in.....	61	43
82 to 84 in.....	61	43
84 to 86 in.....	61	43
86 to 88 in.....	61	43
88 to 90 in.....	61	43
90 to 92 in.....	61	43
92 to 94 in.....	61	43
94 to 96 in.....	61	43
96 to 98 in.....	61	43
98 to 100 in.....	61	43

Less than carloads to destinations east of the Mississippi River will be sold at delivered discount for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.

Wire Rods.—Bessemer rods, \$28 to \$28.50; open hearth and chain rods, \$28.50 to \$29.

Steel Rivets.—Structural rivets, ¾-in. and larger, 2.15c. base; cone head boiler rivets, ¾-in. and larger, 2.25c. base; ½-in. and 11-16-in. take an advance of 15c. and ¼-in. and 9-16-in. take an advance of 50c. in lengths shorter than 1-in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

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Pittsburgh

PARK BUILDING, August 10, 1910.—(By Telegraph.)

Pig Iron.—Some odd lots of pig iron in middle hands have been disposed of, while there has been a slight improvement in the inquiry, so that on the whole the market has not lost any ground the past week. A sale of 1000 tons of prompt Bessemer has been made at \$15.25, Valley furnace, to a Bessemer steel interest. A steel company at Canton, Ohio, bought 5000 tons of fourth quarter basic on its inquiry for 10,000 to 12,000 tons, and will defer the purchase of the remainder for some time. It is understood that \$14.50, delivered at Canton, was paid for the iron bought, netting \$14 at furnace. Sales have been made of about 2000 tons of off basic at under \$14, Valley furnace. There are inquiries for 800 tons of Bessemer for a steel casting interest, fourth quarter, and 500 tons of basic or early delivery to another interest. We note sales of one carload of prompt foundry iron at \$14.25, Valley furnace, and 200 tons of fourth quarter at \$14.40. We quote the market at Valley furnaces, 90c. higher delivered Pittsburgh, as follows: Bessemer, \$15.25; basic, \$14.25 to \$14.50; No. 2 foundry, \$14.25; gray forge, \$13.50; malleable Bessemer, \$14.50 to \$14.75, the higher price, when there is a range, being for later delivery.

Steel.—The tone of the billet and sheet bar market is somewhat easier, as there is considerable surplus capacity, but prices are not quotably lower, and we quote Bessemer billets, 4 x 4 in., \$24.50 to \$25; Bessemer sheet bars, \$25.50 to \$26; 4 x 4 in. open hearth billets, \$26; open hearth sheet and tin bars, \$26.50 to \$27; open hearth small billets, \$27; forging billets, \$30 to \$31, all f.o.b. Pittsburgh, Wheeling or Youngstown district, with freight to point of delivery added. The quotation of \$26 to \$26.50 on Bessemer sheet bars in the issue of July 28 should have been \$26 flat.

(By Mail.)

The finished steel market has become still quieter, new buying being extremely light. Shipments, however, are fairly well maintained, specifications being good considering the amount of buying that has been done lately. In some lines a slight increase in specifications is noted, as compared with July. The railroads are conspicuous by their absence as buyers. A feature of the market is the steadiness with which bars, plates and shapes are being held at a minimum of 1.40c., Pittsburgh, by leading interests. The price was done two months or more ago on plates and shapes, but no important transactions below this level are believed to have been made, while it has only been lately that the price was done on steel bars, and even now it is made only on the most attractive business. The result of the Amalgamated Association's per capita vote on the strike matter was announced late this afternoon, 63.2 per cent. being in favor of continuing the strike against the open shop of the American Sheet & Tin Plate Company and 36.8 per cent. in favor of calling it off. The strike will therefore be continued, but no new plans for prosecuting it vigorously have been announced.

Ferromanganese.—The inquiry is light and only for odd lots for early shipment. We continue to quote, f.o.b. Baltimore, \$39 to \$39.50 for prompt delivery.

Ferrosilicon.—A leading manufacturer of blast furnace ferrosilicon states that there has been more inquiry the past week than at any time for a year. Prices are unchanged. We quote 50 per cent. ferrosilicon at \$57.50 to \$58, delivered, Pittsburgh. Blast furnace ferrosilicon is quotable at \$23 for 10 per cent.; \$24 for 11 per cent., and \$25 for 12 per cent., f.o.b. Jisco and Ashland furnaces.

Rods.—The Jones & Laughlin Steel Company is this week putting its rod mill at Aliquippa in operation, on billets shipped from the Pittsburgh plant. The output will be relatively light for a month, or until the first of the Talbot steel furnaces at Aliquippa is put in operation. The market has been quiet, but prices are a shade easier, rods being sold in some exceptional cases at \$28. We quote the market at \$28 to \$28.50 for Bessemer and at \$28.50 to \$29 for open hearth, Pittsburgh.

Skelp.—Specifications are fairly good for sheared skelp, as the pipe mills are doing well on large sizes, and there is a moderate amount of new business, on which regular prices are occasionally cut. For ordinary widths and gauges we quote grooved steel skelp at 1.50c. to 1.55c.; sheared steel skelp, 1.60c. to 1.65c.; grooved iron skelp, 1.80c., and sheared iron skelp, 1.90c., all f.o.b. mill, Pittsburgh.

Steel Rails.—Some stir has been caused by the report that the Illinois Steel Company, in competition with Belgian manufacturers, has sold 20,000 tons of standard rails to a Western railroad at \$1.50 less than the recognized price,

which has been adhered to since the advance from \$26 to \$28 in February, 1901. A specific denial that any such transaction occurred is made by the local rail interests, and it is suggested that there is more disposition on the part of rail makers to advance than reduce prices, on account of the increase in cost of manufacture in the past nine years by reason of the ores used being leaner and wages and supplies having gone up, besides which the greatly increased stringency of specifications and inspection in the past two or three years has added materially to the production cost. We quote standard sections of Bessemer rails at \$28, mill, and light rails as follows: 8 to 10 lb., \$32; 12 to 14 lb., \$29; 16, 20 and 25 lb., \$28; 30 and 35 lb., \$27.75, and 40 and 45 lb., \$27, Pittsburgh. We quote steel axles at 1.75c. to 1.80c., and splice bars at 1.50c., at mill.

Structural Material.—The fabricating shops are fairly busy, and will be for two or three months with the work now on books, but new business is light. Fabricating prices are very low, compared with costs of plain shapes. We quote beams and channels, 15-in. and under, at 1.40c. to 1.45c., Pittsburgh.

Plates.—The steel car shops find new orders falling far short of equaling those that are being filled, but they are still busy and taking a round tonnage of plates. The railroads are expected to buy cars more freely late in the year. Mills making a full range of sizes are firm at a minimum of 1.40c., Pittsburgh, on plates, and obtain 1.45c. on less desirable business, but a few small mills making only a limited range sell at 50c. to \$1 a ton under this minimum on such orders as they can pick up.

Sheets.—The vote of the Amalgamated Association to continue the strike against the open shop of the American Sheet & Tin Plate Company will not affect the sheet situation, as this interest had succeeded in operating all its sheet mills except the Aetna-Standard, at Bridgeport, Ohio, but has lately been operating somewhat intermittently at its Kiskiminetas Valley plants outside of Vandergrift. New demand is extremely light for sheets, and this is attributed to its being the vacation season. Specifications and deliveries are quite heavy. We quote one-pass box annealed sheets at 2.20c. to 2.25c., depending on delivery, and galvanized at 3.30c. to 3.35c., both for No. 28 gauge.

Tin Plate.—The vote of the Amalgamated Association to continue the strike averts the possibility of a material increase in tin plate production, as in the event of the strike being called off the leading interest was expected to start the Martins Ferry and La Belle plants, in the Wheeling district, besides recruiting its forces at some plants now in operation, where, on account of the weather, extra men can be used to increase output. Tin plate continues scarce and is being shipped as fast as produced, but buying for far forward delivery is relatively light. The leading interest is said to be sold into February at its present rate of output and to be three months behind in deliveries, while independents are sold into November. We quote the market very firm at \$3.60, Pittsburgh, for 100-lb. cokes. Occasionally premiums up to 15c. per box are paid for prompt delivery of small lots.

Bars.—The steel bar market is at an absolute minimum of 1.40c., Pittsburgh, while on odd lots 1.45c. is usually obtained. Specifications on steel bar contracts are heavy, but new business is relatively light. Iron bars continue in light demand, remaining quotable at 1.45c. to 1.50c., Pittsburgh.

Spelter.—There is a moderate demand for spelter for early shipment, but no forward buying. Prices are stationary and we continue to quote prime Western grades at 5c. to 5.05c., East St. Louis, or 5.12½c. to 5.17½c., delivered, Pittsburgh.

Hoops and Bands.—Specifications continue fairly good, but new buying is light. We quote steel hoops at 1.50c. to 1.55c. and bands at 1.45c. to 1.50c., the latter with extras on the steel band card.

Spikes.—The demand for spikes is light, and there is not a great deal of contract business on books. We quote standard sizes of railroad spikes, 4½ x 9-16 in. and larger, at 1.50c. to 1.55c. for Western shipment and 1.55c. to 1.60c. for local trade, but some of the producers refuse to go below 1.55c. on any business. We quote small railroad and boat spikes at 1.60c. to 1.65c., base, far carload and larger lots.

Rivets.—New business continues light, while specifications are fairly satisfactory. Official prices on structural rivets are 2.15c. and on boiler rivets 2.25c., f.o.b. Pittsburgh, but these prices are shaded on desirable orders.

Shafting.—New demand for shafting is light, particularly from the automobile trade, but there is a good line of business on the books of producers. Regular discounts on shafting are 55 per cent. off in carload and larger lots and 50 per cent. off in small lots, delivered in base territory. For desirable specifications the carload price of 55 per cent. off is sometimes shaded to the extent of an extra 5 per cent.

Wire Products.—There has been fairly good buying of

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wire products since the recent reduction, but the buying is confined to deliveries in the next 30 to 60 days, buyers not taking hold very freely for the regular fall trade. We quote galvanized barb wire at \$2; painted, \$1.70; annealed fence wire, \$1.50; galvanized, \$1.80; wire nails, \$1.70, and cut nails, \$1.65 to \$1.70, in carload and larger lots, all f.o.b. Pittsburgh, freight to destination added.

Merchant Pipe.—The Philadelphia Company has placed with a contractor 18 miles of 16-in. line pipe, and the order for the pipe is expected to go to the leading pipe producer. It has placed an order for 5 miles of 12-in. with an independent, and the Arkansas Natural Gas Company has also placed with an independent an order for 7 miles of 10-in. Official discounts are reported as being absolutely maintained on steel pipe and fairly well on iron pipe.

Boiler Tubes.—There is a moderate demand for boiler tubes, and specifications are fairly satisfactory. Regular discounts continue to be shaded.

Coke.—The Standard Sanitary Mfg. Company has placed two contracts for standard 72-hour Connellsville foundry coke, aggregating 10 to 15 cars weekly, one for 11 months, to July 1 next, and the other for 12 months, to August 1, prices being just a shade under \$2.25 per net ton, at oven. Furnace coke is in very light demand. Prices are well maintained, as production seems to be closely regulated to demand. We quote standard coke, per net ton, at oven, as follows: Prompt furnace coke, \$1.65; prompt foundry coke, \$2.15 to \$2.25; contract foundry coke, \$2.25 to \$2.50.

Iron and Steel Scrap.—The market for heavy melting steel is quieter since the sudden buying reported last week and prices are hardly as firm on this grade. We quote as follows for delivery at Pittsburgh or elsewhere, as stated:

Heavy steel scrap, Steubenville, Folsom, Sharon, Monessen and Pittsburgh delivery.....	\$14.25 to \$14.50
No. 1 foundry cast.....	14.00 to 14.25
No. 2 foundry cast.....	13.00 to 13.25
Bundled sheet scrap, at point of shipment.....	9.75 to 10.00
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.....	15.75 to 16.00
No. 1 railroad malleable scrap.....	13.75 to 14.00
Grate bars.....	10.75 to 11.00
Low phosphorus melting stock.....	18.00 to 18.50
Iron car axles.....	21.00 to 21.50
Steel car axles.....	19.00 to 19.50
Locomotive axles.....	25.00 to 25.50
No. 1 bushelling scrap.....	12.50 to 12.75
No. 2 bushelling scrap.....	8.50 to 8.75
Old car wheels.....	14.00 to 14.50
Sheet bar crop ends.....	16.00 to 16.25
Cast iron borings.....	7.50 to 7.75
Machine shop turnings.....	9.25 to 9.50

Chicago

FISHER BUILDING, August 10, 1910.—(By Telegraph.)

Current business and small operations are apparently going forward at a normal rate. The fabricating shops in the West are filled up with small jobs, this class of business in structural shapes having grown to larger proportions than ever known before. The scarcity and high price of timber suitable for bridges and warehouse beams have made steel cheaper than wood, and this is having a considerable effect on the demand for small lots of structural shapes. Building codes in the cities are also becoming more rigid, and altogether the fabricating interests are so well supplied with work that they are not much affected by financial conditions which are holding back contracts for large jobs. In other directions the same indications are found of growth in the general consumption of steel. Shipments of merchant steel into this territory the past month broke all records for July in the value of shipments and were second only to July last year in the tonnage. The demand for open hearth sheets is better than the local mills had any reason to expect in August. There is a steady run of current business in bars, principally for concrete work. Orders for wire products are coming in at a good rate, without any of the speculative demand which was apparent last year, when higher prices were expected. The weak spots in the market are those affected by the purchasing power of the railroads. The lack of railroad orders is felt most seriously by the bar iron mills, but it also affects the plate and structural mills on material for car building. There has been good consumptive buying of copper for deliveries extending into October, but the demand for spelter and other metals is light. Old material is weak and lower.

Pig Iron.—The pig iron market here is going through the duller period of the year, and men who have been actively interested in this trade for years say they have never known the demand to be so light in normal times. The foundries are all doing a fair amount of business and their melt has not fallen off to any great extent, but they are generally covered several months ahead. Even the malleable foundries are fairly busy, as the growth in their demand from other sources has offset to a considerable extent the

lack of railroad orders. The furnace interests are disappointed to find a growing tendency among buyers to wait until they can purchase for next year. Very little business has been done thus far for the first quarter or first half of 1911, and only under special conditions. In some cases buyers can make contracts for Southern iron for the first half of 1911 at \$11.50, Birmingham, purchasing from merchant interests buying spot iron at \$11 and carrying it on warrants until time for shipment. A stove interest in western Michigan has purchased 1000 tons of Southern high silicon for delivery this year and is in the market for another 1000 tons of high silicon for first half, as well as 2000 tons each of Northern and Southern foundry, but it is understood that the 1911 business has not been placed. Small lots of Southern foundry are being sold at \$11.50 for current shipment or last half, and this appears to be the minimum on small lots of standard brands. The \$11 price is only available on larger transactions for prompt or last half delivery. Northern iron is selling at \$16 to \$16.50, at furnace, for early deliveries, with switching charges added to make the price quoted for Chicago delivery. Many buyers express a willingness to cover round lots for the first half, but the furnace interests are determined to wait as long as they can before opening their books for next year's business. The following quotations are for August and September shipment, Chicago delivery:

Lake Superior charcoal.....	\$18.50 to \$19.00
Northern coke foundry, No. 1.....	17.00 to 17.50
Northern coke foundry, No. 2.....	16.50 to 17.00
Northern coke foundry, No. 3.....	16.25 to 16.50
Northern Scotch, No. 1.....	17.50 to 18.00
Southern coke, No. 1.....	15.85 to 16.35
Southern coke, No. 2.....	15.35 to 15.85
Southern coke, No. 3.....	15.10 to 15.60
Southern coke, No. 4.....	14.85 to 15.35
Southern coke, No. 1 soft.....	15.85 to 16.35
Southern coke, No. 2 soft.....	15.35 to 15.85
Southern gray forge.....	14.60 to 15.10
Southern mottled.....	14.60 to 15.10
Malleable Bessemer.....	16.50 to 17.00
Standard Bessemer.....	17.90 to 18.40
Jackson Co. and Kentucky silvery, 8%.....	19.40 to 19.90
Jackson Co. and Kentucky silvery, 8%.....	20.40 to 20.90
Jackson Co. and Kentucky silvery, 10%.....	21.40 to 21.90

(By Mail.)

Billets.—Occasional sales are made to consumers in this district at \$29 to \$30, base, Chicago, for open hearth billets, making Chicago an independent market for this material. No regular Chicago price can be quoted on Bessemer billets, as the price that would be done would depend upon the quality and other considerations.

Rails and Track Supplies.—New business in standard rails is very light, but there is no effort on the part of the railroads to hold back deliveries on the tonnage bought for this year, and in some cases important roads have requested earlier deliveries than they had specified in their contract. The demand for track supplies, however, is not so urgent as it was during the spring. We quote standard railroad spikes at 1.75c. to 1.85c., base; track bolts with square nuts, 2.40c. to 2.50c., base, all in carloads, Chicago. Light rails, 40 to 45 lb., \$27; 30 to 35 lb., \$27.50; 16, 20 and 25 lb., \$28; 12 lb., \$29, Chicago.

Structural Material.—The demand for small lots of structural material throughout the West is very heavy, and fabricators generally have about all the business of this kind that they can handle. One large fabricating shop which is oversold has endeavored recently to place several hundred tons of plate girder bridges with some other plant for shipment within 60 days, but has found it difficult to get the desired delivery. Many large projects, however, are held back by financial considerations, owing to the critical attitude adopted by the banking and insurance interests which underwrite mortgages or bonds on large buildings, and only a few jobs of moderate size were reported closed last week. The Oregon Railway & Navigation Company let to Milliken Brothers a contract for a freight house at Seattle, Wash., which will require 600 tons. Buildings for the Utah Copper Company near Salt Lake which call for 450 tons will be fabricated and erected by the Minneapolis Steel & Machinery Company. There are rumors of concessions in price on large lots of plain material from mill, but on ordinary business the market is firm at 1.40c., Pittsburgh. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

Plates.—The mills still have a fair amount of business on their books growing out of car contracts that were placed last spring. No new car inquiries are reported, however, although the Alton, which inquired some time ago, is still figuring on a good lot of cars. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

Sheets.—There is a good run of new business in open hearth sheets, the tonnage sold being better than any one had reason to expect at this season of the year, and in view of quiet conditions in other lines. Prices, however, are somewhat irregular, depending largely on the quantity on which

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the buyer seeks quotations. We quote as follows, Chicago: No. 10 annealed, 1.93c.; No. 28 black, 2.43c.; No. 28 galvanized, 3.48c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.20c. to 2.30c.; No. 28 black, 2.85c. to 2.95c.; No. 28 galvanized, 3.90c. to 4c.

Bars.—Some of the local mills are meeting the 1.40c. price quoted in Pittsburgh on soft steel bars, but only on attractive specifications. An order for a good lot on one or two standard sizes is generally given the preference by the mills, but where many sizes are specified in one order, making a small quantity of each size or section, higher prices are asked. Hard steel bars are going at a differential of about \$2 per ton under soft steel, and the local mills are quoting about \$1 lower than the price they have maintained thus far. The market for bar iron is very dull, as there is not much business going except from wagon and implement manufacturers. The railroad purchasing departments are working under orders to restrict their purchases to the minimum, and the bar iron mills feel the force of this restriction more than any other branch of the iron and steel business, as the railroad demand represents 75 per cent. of the normal consumption of bar iron in this territory. While 1.40c., Chicago, can be shaded on a good order for iron bars for prompt shipment, this price continues to represent the minimum on current business. Subject to the usual delay in delivery of soft steel bars, we quote as follows: Soft steel bars, 1.58c. to 1.63c.; bar iron, 1.40c. to 1.45c.; hard steel bars rolled from old rails, 1.45c. to 1.55c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

Rods and Wire.—There is a fair run of new business from the jobbing trade, and manufacturers are also furnishing good specifications on industrial grades of wire. There is no speculative buying this fall, in anticipation of profits such as jobbers made by stocking up last year, but the demand is believed to represent a good normal rate of consumption. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c., all Chicago.

Merchant Steel.—A leading manufacturer advises that its shipments into this territory in the month of July were the largest in the history of the business in the value of the product, and in tonnage second only to July, 1909. This business consists chiefly of agricultural steel and goes to show that manufacturers who depend upon the agricultural trade are doing a very satisfactory business.

Old Material.—As usual, the scrap market reflects the undertone of weakness in the iron and steel industry. The lack of buying orders from railroads has made the business of the bar iron mills as dull recently as it was during a few months following the panic of 1907, and while the mills like to accumulate scrap when it is cheap there is little encouragement to buy when they cannot sell the product. This is also the case with malleable foundries. The rerolling mills are able to get all the old rails they can use at \$15.50, delivered to Chicago mills. Steel axle turnings and machine shop turnings are quoted lower. While there is not much change in other prices, the market is weak and dealers are proceeding cautiously in their trades. The prices quoted below are for material delivered to buyers' works, all switching charges paid. Manufacturers in this district who sell scrap usually receive 50c. to \$1 less. Following prices are per gross ton, delivered, Chicago:

Old iron rails.....	\$16.50 to \$17.00
Old steel rails, rerolling.....	15.25 to 15.75
Old steel rails, less than 3 ft.....	13.50 to 14.00
Relaying rails, standard sections, subject to inspection.....	24.00 to 25.00
Old car wheels.....	14.50 to 15.00
Heavy melting steel scrap.....	12.25 to 12.75
Frogs, switches and guards, cut apart.....	12.25 to 12.75
Shoveling steel.....	11.75 to 12.25

The following quotations are per net ton:

Iron angles and splice bars.....	\$14.00 to \$14.50
Iron car axles.....	19.50 to 20.00
Steel car axles.....	19.50 to 20.00
No. 1 railroad wrought.....	12.00 to 12.50
No. 2 railroad wrought.....	11.00 to 11.50
Springs, knuckles and couplers.....	11.50 to 12.00
Locomotive tires, smooth.....	17.00 to 17.50
No. 1 dealers' forge.....	10.50 to 11.00
Steel axle turnings.....	8.50 to 9.00
Machine shop turnings.....	7.00 to 7.50
Cast and mixed borings.....	4.75 to 5.25
No. 1 bushing.....	10.25 to 10.75
No. 2 bushing.....	8.00 to 8.50
No. 1 boilers, cut to sheets and rings.....	9.00 to 9.50
No. 1 cast scrap.....	12.75 to 13.25
Stove plate and light cast scrap.....	11.00 to 11.50
Railroad malleable.....	11.00 to 11.50
Agricultural malleable.....	10.50 to 11.00
Pipes and flues.....	9.25 to 9.75

Cast Iron Pipe.—The leading pipe interest has booked 3400 tons of water pipe at Cheyenne, Wyo. No other important lettings are reported for the past week, but there is a fair amount of routine business. Owing to the decline in pig iron, cast iron pipe is now quoted 50c. lower in this

market. On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., \$27.50; 6 to 12 in., \$26.50; 16-in. and up, \$25.50, with \$1 extra for gas pipe.

Metals.—See paragraph on this subject under the heading "Metal Market," in another column.

Philadelphia

PHILADELPHIA, PA., August 9, 1910.

Consumers still show little disposition to enter the market for requirements beyond immediate needs, although in some instances a cautious feeling around for more extended delivery is noted. Prices for the most part are firm at the recently established levels, although concessions could be had in some classes of finished materials if desirable specifications were offered. On the whole, transactions in pig iron as well as in rolled products have been on a narrow basis, and sellers are not disposed to force business, anticipating a better buying movement in the near future. The demand for plates and shapes has been less active; that for iron bars, however, shows a slight betterment.

Pig Iron.—Transactions have been comparatively light, neither buyer nor seller showing any particular interest in the market. Sales for the most part have been in the foundry grades, with consumers taking small lots sufficient for near future needs. There is a feeling among the trade, however, that the time is not far distant when more aggressive buying will be necessary, as the majority of the melters have been out of the market so long that, it is thought, stocks on hand must have become pretty low. At the present range of prices producers contend that actual bottom has been reached, and state that at present cost of production they can go no lower without incurring a considerable loss. Sales have been principally in small lots, with an occasional order for a few hundred tons, at \$16 to \$16.50 for No. 2 X foundry, delivered in this vicinity, although the greater proportion of the sales are made close to \$16.25, delivered. Virginia foundry iron for August-September delivery can be had at \$13.25, furnace, for No. 2 X. The majority of the sellers hold around \$13.50. In one instance \$13.50, furnace, has been named for No. 2 plain, and \$13.75 for No. 2 X for last quarter shipment. Transactions have been small, however, and at prices representing about \$16 to \$16.50 for No. 2 X, delivered in this vicinity. At the lower ranges the same price is quoted for either No. 2 X or No. 2 plain grades. Cast iron pipe foundries have taken some low grade iron and are still considering further purchases, but no important sales have been recently announced. The demand for forge iron for rolling mill purposes has been unimportant; several small sales have been made, but the business has been scarcely sufficient to establish a market, which is still nominally quoted at \$15 to \$15.25, delivered. No movement in basic iron is reported. Buyers are pretty well covered for near future needs and sellers await further developments. It is believed that \$15, delivered, could be done if any tonnage in this grade was offered. Low phosphorus iron of standard grade has been sold in lots of a few hundred tons at unchanged prices. The following range about represents the market for moderate lots for early delivery in buyers' yards, eastern Pennsylvania and nearby points:

Eastern Pennsylvania, No. 2 X foundry.....	\$16.00 to \$16.50
Eastern Pennsylvania, No. 2 plain.....	15.75 to 16.25
Virginia, No. 2 X foundry.....	16.00 to 16.50
Virginia, No. 2 plain.....	16.00 to 16.25
Gray forge.....	15.00 to 15.25
Basic.....	15.25 to 15.75
Standard low phosphorus.....	22.50 to 22.75

Ferromanganese.—Very little demand is reported. Eastern consumers show no interest in the market, although some small business continues to be done in the West. Prices are unchanged, \$39 to \$40, Baltimore, about representing the range of quotations for 80 per cent., dependent on tonnage and delivery.

Billets.—Business has been confined to small lots for prompt shipment. Larger consumers show little disposition to enter the market, and the general situation is easy. For small lots Eastern mills quote \$27.50 to \$28 for ordinary rolling billets, delivered in this vicinity, with forging billets at \$29.50 to \$30, at Eastern mill, the usual extras applying for high carbons and special sizes.

Plates.—The majority of the Eastern mills report a fair run of miscellaneous orders, smaller in the aggregate in some instances than that of the previous week, but sufficient to keep plants fairly well occupied. There is still an absence of inquiries for large lots, although some consumers would contract for the last half, if mills would accept the business. Prices show no change, being held for the time at 1.55c. to 1.60c., delivered in this territory, for the general run of business, although some makers are still able to get 1.65c., delivered, for small orders.

Structural Material.—The market shows more irregu-

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larity, and some makers report a decline in both inquiries and orders. The bulk of the business recently placed has been of a rather miscellaneous character, although some good tonnages are in sight. Additional work on abolishing grade crossings by the Philadelphia & Reading Railroad is nearly ready for estimate, but details are not yet available. Prices are unchanged, 1.55c. to 1.60c., delivered in this vicinity, about representing the market for plain shapes.

Sheets.—The demand continues of a spotty character, consumers placing, as a rule, orders for immediate needs only. Very little forward business is offered and mills' order books are not in very satisfactory shape. Concessions for large lots are still available. For small spot lots the following range of quotations represents prices of Eastern manufacturers: Nos. 18 to 20, 2.70c.; Nos. 22 to 24, 2.80c.; Nos. 25 and 26, 2.90c.; No. 27, 3c.; No. 28, 3.10c.

Bars.—More inquiry for refined iron bars has developed during the week, and mills have been making better sales. A few fair sized lots are before the trade and the situation is a trifle more encouraging. Prices, however, are not particularly strong. On large lots, carrying desirable specifications, 1.40c., delivered in this territory, might be done, although for the general run of business 1.42½c. to 1.50c., delivered, about represents the market. Steel bars are quoted at 1.55c. to 1.60c., delivered in this vicinity.

Coke.—The market has been quiet. Occasional sales of foundry coke for prompt and last half delivery are reported at unchanged prices. Furnace coke continues dull. The market drags, although prices remain comparatively firm, the following range representing quotations per net ton, delivered in buyers' yards in this vicinity:

Connellsville furnace coke.....	\$4.00 to \$4.15
Foundry coke.....	4.50 to 4.75
Mountain furnace coke.....	3.60 to 3.75
Foundry coke.....	4.10 to 4.35

Old Material.—Transactions have been light. Mills show but little interest in the situation, being pretty well supplied with the various grades, buying only when material is offered at a low price. Cancellations of orders have weakened the market in some directions, resulting in sales at lower prices. The leading buyer has reduced offering prices for certain grades, and transactions have in the majority of cases been insufficient to establish quotations. Bids and offers for delivery in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia of 45 cents to \$1.30, range as follows, per gross ton:

No. 1 steel scrap and crops.....	\$13.75 to \$14.00
Old steel rails, rerolling.....	15.50 to 16.00
Low phosphorus.....	19.00 to 19.50
Old steel axles.....	20.00 to 20.50*
Old iron axles.....	26.50 to 27.50*
Old iron rails.....	18.00 to 18.50
Old car wheels.....	14.00 to 14.50
No. 1 railroad wrought.....	15.50 to 16.00
Wrought iron pipe.....	13.50 to 14.00
No. 1 forge fire.....	12.00 to 12.50
No. 2 light iron.....	8.75 to 9.25
Wrought turnings.....	9.25 to 9.75
Cast borings.....	14.50 to 15.00
Machinery cast.....	14.00 to 14.50
Railroad malleable.....	11.50 to 12.00
Grate bars.....	10.00 to 10.50
Stove plate.....	10.00 to 10.50

* Nominal.

St. Louis

ST. LOUIS, MO., August 8, 1910.

An increase of almost \$22,000,000 in the bank clearings for July, with an increase of \$239,510,000 for the first seven months of 1910 over the corresponding period of 1909, is regarded as a very satisfactory showing for this city. It is confidently expected that the clearings at the close of the year will reach the \$4,000,000,000 mark for the first time in the history of St. Louis. Collections are reported as good with most interests and in pig iron shipments on prior contracts are for the most part being made according to contract specifications. A 14-story addition to the *Times* Building, costing \$250,000, is to be erected; also a 17-story office building at Seventh and Chestnut streets, to be called the Leathe Building, costing upward of \$600,000.

Coke.—A quiet market is reported, with the exception of one office, where in the aggregate contracts covering upward of 3000 tons were booked. Merchant sellers are still effecting sales of small lots, mostly to out of town buyers. The business referred to above was in Virginia foundry coke, while there are moderate transactions in Connellsville foundry. Prices in the Connellsville district are hardening, and we quote for shipment over a year 72-hour foundry at \$2.40 per net ton f.o.b. oven for standard brands. Virginia coke is held at \$2.25. On jobbing trade prices are 25c. per ton higher.

Pig Iron.—In attempting to account for the unsatisfactory situation in pig iron, one of the older representatives of furnace interests is inclined to attribute it to some extent

to heavy speculative buying last fall. Too many furnacemen counted this iron as disposed of, while it was still on the market, and continued producing rather heavily. It not only had not gone into consumption to any extent, but became a competitor and generally led in the decline. The feature of the market is the wide range in price, especially in Southern iron, it being \$1 per ton. In view of the fact that some of the leading sellers are holding for the outside price, they have in consequence no business to report. The representative of a leading house secured a contract for 2000 tons and another for 500 tons No. 2 Southern foundry for shipment over the remainder of the year, and another office, in the aggregate, booked orders for 950 tons. A leading broker reports an inquiry for 2500 tons Lake Superior charcoal iron for shipment over the remainder of the year; also an inquiry for 1000 tons foundry iron for shipment over the first quarter of 1911. As far as can be learned there are no prices out for 1911 iron. Business, so far as any has been transacted, is the result of the acceptance of firm offers. We quote No. 2 Southern foundry for shipment over the remainder of the year at \$11, with some houses asking \$11.50 and others \$12 f.o.b. Birmingham. Southern Ohio is nominally \$15 f.o.b. furnace.

Finished Iron and Steel.—The leading interest reports a quiet market on standard rails, with a fair inquiry for light rails, coming principally from coal interests. In structural material the volume of new business is moderate. In bars there is a seasonable inquiry with urgent requests for filling back orders. The demand for track material is running lighter.

Old Material.—The offerings by the local railroads during the past week were quite large, the lists being as follows: Missouri Pacific, 2000 tons; Wabash, 1500 tons; St. Louis & San Francisco, 1000 tons. Though the demand from consumers is still light, there is more trading among dealers, locally and for shipment. With regard to prices, the figures quoted on some items in the absence of business represent asking prices. The tone of the market is weaker, in sympathy with pig iron. Relaying rails continue scarce and are urgently wanted. We quote dealers' prices as follows, per gross ton, f.o.b. St. Louis:

Old iron rails.....	\$14.50 to \$15.00
Old steel rails, rerolling.....	14.00 to 14.50
Old steel rails, less than 3 ft.....	13.00 to 13.50
Relaying rails, standard sections, subject to inspection.....	23.50 to 24.00
Old car wheels.....	14.50 to 15.00
Heavy melting steel scrap.....	12.50 to 13.00
Frogs, switches and guards, cut apart.....	12.50 to 13.00

The following quotations are per net ton:

Iron fish plates.....	\$14.00 to \$14.50
Iron car axles.....	19.50 to 20.00
Steel car axles.....	19.00 to 19.50
No. 1 railroad wrought.....	13.00 to 13.50
No. 2 railroad wrought.....	12.00 to 12.50
Railway springs.....	11.50 to 12.00
Locomotive tires, smooth.....	16.50 to 17.00
No. 1 dealers' forge.....	11.00 to 11.50
Mixed borings.....	5.50 to 6.00
No. 1 busheling.....	10.50 to 11.00
No. 1 boilers, cut to sheets and rings.....	9.50 to 10.00
No. 1 cast scrap.....	10.50 to 11.00
Stove plate and light cast scrap.....	9.00 to 9.50
Railroad malleable.....	9.50 to 10.00
Agricultural malleable.....	8.50 to 9.00
Pipes and flues.....	9.50 to 10.00
Railroad sheet and tank scrap.....	8.50 to 9.00
Railroad grate bars.....	8.50 to 9.00
Machine shop turnings.....	8.00 to 8.50

Metals.—See paragraph on this subject under the heading "Metal Market," in another column.

The Missouri Iron Ore Company, St. Louis, has been incorporated; capital stock, \$300,000. The principal stockholder is Aaron B. Donaldson, vice-president of the St. Louis Tie Company. The company will be interested in iron ore lands in Missouri.

D. C. Nevin, president of the St. Louis-Kansas City Electric Railway Company, has returned from Paris, where he placed a \$15,000,000 bond issue for the building of the road. Construction is expected to begin this fall.

Cincinnati

CINCINNATI, OHIO, August 10, 1910.—(By Telegraph.)

Pig Iron.—The past week has brought out no important developments. There is little trading, with not very many inquiries. Next year's business is not being sought by the furnace interests and requests for prices for this delivery are generally answered with a figure that is now considered prohibitive. However, there is a better feeling all round, and even the foundry people appear to share in the belief that there will be a betterment in prices at no distant day. Their melt for the past eight months is stated to be larger than for any previous corresponding period, and while it has recently fallen off somewhat, stocks on hand are constantly being depleted. The stove foundries seem to hold

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a prominent place among the large consumers. Later, when crop reports are more certain, a quicker change may take place than has been anticipated. For Southern No. 2 foundry we quote \$11 to \$11.50, Birmingham district, and for Northern No. 2 \$14.50 to \$15, Ironton. The Red River Company's Helen Furnace goes out of blast this week. For immediate delivery and through the last half, based on freight rates of \$3.25 from Birmingham and \$1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry.....	\$14.75 to \$15.25
Southern coke, No. 2 foundry.....	14.25 to 14.75
Southern coke, No. 3 foundry.....	13.75 to 14.25
Southern coke, No. 4 foundry.....	13.50 to 14.00
Southern coke, No. 1 soft.....	14.75 to 15.25
Southern coke, No. 2 soft.....	14.25 to 14.75
Southern gray forge.....	13.50 to 14.00
Ohio silvery, 8 per cent, silicon.....	19.20
Lake Superior coke, No. 1.....	16.20 to 16.70
Lake Superior coke, No. 2.....	15.70 to 16.20
Lake Superior coke, No. 3.....	15.20 to 15.70
Standard Southern car wheel.....	25.25 to 25.75
Lake Superior car wheel.....	22.25 to 22.75

(By Mail.)

Coke.—Shipments on contracts are good, but new business is of a small character. It is understood that the foundries have pretty generally contracted for future requirements and the furnaces are light purchasers. The stiff price of coal, caused by the good demand for it, has had some effect in keeping prices firm on coke. Connellsville furnace coke remains at \$1.70 to \$1.85, per net ton, at oven, and Pocahontas furnace grades around \$1.85. Foundry coke in the Connellsville, Pocahontas and Wise County districts is selling from \$2.10 to \$2.25 at shipping point, and it is understood that a few ovens would accept business at \$2, though quite a large number of operators have sold up to the limit of output.

Finished Iron and Steel.—Every line is quiet. Local dealers report a fair demand for structural material from stock, with prices for beams and channels around 1.90c. to 2c. Steel bars can be obtained from stock at 1.80c.

Old Material.—Offerings are light and sales are on the same level. Prices for delivery in buyers' yards, Cincinnati and southern Ohio, are as follows:

No. 1 railroad wrought, net ton.....	\$12.50 to \$13.00
Cast borings, net ton.....	4.50 to 5.00
Steel turnings, net ton.....	6.00 to 7.00
No. 1 cast scrap, net ton.....	11.50 to 12.50
Burnt scrap, net ton.....	8.00 to 9.00
Old iron axes, net ton.....	17.50 to 18.50
Old steel rails, gross ton.....	14.50 to 15.00
Relaying rails, 50 lb. and up, gross ton.....	22.50 to 23.50
Old car wheels, gross ton.....	12.00 to 13.00
Heavy melting steel scrap, gross ton.....	12.00 to 12.50

Buffalo

BUFFALO, N. Y., August 9, 1910.

Pig Iron.—Considerable activity in inquiry has developed during the week, principally for foundry grades, but including some requests on malleable from New York State, Connecticut and eastern New England points. Only a small proportion of the inquiries, however, materialize into orders of a size worth mentioning. A valve concern in Connecticut had inquiries out for a tonnage of some importance, two-thirds of which was for foundry iron and one-third for malleable. Another inquiry was for 1000 tons of No. 2 X foundry; also one for 2000 tons of malleable, on which the business is reported to have been placed at the minimum price of the current schedule and one for high silicon iron for fourth quarter and first quarter deliveries. The indications are that most purchasers are pursuing a hand to mouth policy, splitting known requirements into separate and frequently placed orders instead of ordering as ordinarily in larger quantities, thus being enabled to take advantage of any lowering of current quotations or to jump in with larger orders in case of manifestation of a stiffening tendency in prices. Many small foundries are now very busy on old orders, but the general situation appears to be one of slowing down in consumption. Prices are not materially changed from last week. We quote as follows, f.o.b. Buffalo, for delivery through last half:

No. 1 X foundry.....	\$15.00 to \$15.50
No. 2 X foundry.....	14.50 to 15.00
No. 2 plain.....	14.25 to 14.75
No. 3 foundry.....	14.00 to 14.50
Gray forge.....	14.00 to 14.25
Malleable.....	14.75 to 15.25
Basic.....	15.25 to 15.75
Charcoal.....	18.75 to 19.25

Finished Iron and Steel.—Most agencies report the demand for steel bars fully up to expectations, with fairly good bookings for the midsummer season. The principal interest and some others state that prices are held at 1.45c., Pittsburgh; other interests admit having made some concessions from this figure "to meet competition," consequently on material not required for immediate use some consumers are holding off with the expectation of buying lower. Re-

cent reductions in wire products have started a good buying movement and large tonnages are being placed. The market for shapes is fair, with 1.45c., Pittsburgh, for the general run of orders, but on large orders for long lengths 1.40c. has been taken. The demand for black and galvanized sheets has been fairly good, but prices are somewhat softer. In structural material the demand continues good, but prices as a rule are a little easier. Bids will soon be called for on the steel for the three buildings of the Buffalo Tuberculosis Hospital at Perrysburg, N. Y., and a number of other local structures will soon be ready for figures. The Lackawanna Bridge Company has received contract for the engineering and machine shop buildings to be erected at Ashtabula, Ohio, by the Great Lakes Engineering Works of Detroit, the contract calling for about 1000 tons. The Buffalo Structural Steel Company has been awarded contract for the fabrication and erection of the steel for the new Sherman House, Jamestown, nearly 900 tons, and the George Kellogg Structural Company has received contract for the steel for the Washington B. French apartment house, Buffalo, 100 tons. Contract for the steel for the Bevier Memorial Art Building to be erected by the Mechanics' Institute at Rochester, about 250 tons, has been awarded to F. L. Hughes & Co., Rochester. The steel contract for the seven-story office and theater building to be erected by Walter Snowden Smith, Syracuse, was taken by the Syracuse Bridge Company.

Old Material.—The market is very dull, both dealers and consumers maintaining a waiting attitude. The new business being transacted is insufficient to establish definite price values, and only a small quantity of material is going forward on old contracts. We quote dealers' nominal prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel.....	\$13.25 to \$13.50
Low phosphorus steel.....	17.50 to 18.00
No. 1 railroad wrought.....	14.00 to 14.50
No. 1 railroad and machinery cast scrap.....	13.25 to 13.50
Old steel axes.....	17.50 to 18.00
Old iron axes.....	22.00 to 22.50
Old car wheels.....	14.00 to 14.50
Railroad malleable.....	13.75 to 14.25
Boiler plate.....	11.25 to 11.50
Locomotive grate bars.....	11.00 to 11.50
Pipe.....	11.00 to 11.50
Wrought iron and soft steel turnings.....	6.50 to 7.00
Clean cast borings.....	5.50 to 6.00
No. 1 busheling scrap.....	11.75 to 12.00

Birmingham

BIRMINGHAM, ALA., August 8, 1910.

Pig Iron.—Some few sales for prompt shipment were made the past week, but the aggregate of tonnage involved is not important. The trade as a whole is apparently no more interested in future deliveries than at the time of last report and the volume of business transacted the present week will no doubt be light. It is now pretty well understood that some of the producing interests would not refuse \$11, Birmingham basis, for a round tonnage to be delivered within a comparatively short time, and reports have been made of even small lots being sold at a concession from \$11.50, Birmingham, yet no specific information in either regard is obtainable and the market is quoted at \$11.50 for prompt deliveries or shipments to cover the remainder of this year. Shipments from furnace yards have so far, since August 1, about kept up at the rate recorded during July and very little additional iron has been put on furnace yards. The actual melt, however, has been reduced and foundry stocks are more in evidence than for some weeks. It is believed that additional furnaces will be blown out this month, although such action will no doubt be governed largely by the results of efforts to deliver tonnage now on order books that was engaged for delivery prior to this time. It will be noticed that requests that shipment against contracts now in force be held up are more frequent, and that of the iron sold early in this year at figures considerably higher than those now ruling a significant proportion still remains on furnace yards or is being held in warrant. Such conditions are believed to be fully accounted for by the condition of the foundry trade generally, and from the best authorities the condition of that trade is not expected to improve at an early date. There has been a fair demand for charcoal iron within the past 10 days, and producers of such iron have succeeded in maintaining a basis of \$22.50, at furnace, for chilling grades.

Cast Iron Pipe.—A contract for 500 tons of water pipe was placed by the city of Gadsden, Ala., the past week, but it has not yet been definitely determined what producer will furnish the material. With this exception, the tonnage entered since last report is represented by a number of small lots for maintenance work which is fairly attractive in the aggregate. Among the contracts now in sight probably the one of most interest to Southern producers will cover approximately 80 miles of gas pipe soon to be placed for the construction of a line from Fayette, Miss., to this city. The specifications for this tonnage are now under consideration,

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but no announcement has so far been made as to the date of award. Indications for new business along the Pacific Coast and in the Middle West are still encouraging, and ample tonnage for the fall and winter months' operations is expected by all interests. No change has been made in quotations since last report and we quote water pipe as follows, per net ton, f.o.b. cars here: 4 to 6 in., \$22.50; 8 to 12 in., \$21.50; over 12-in., average \$20.50, with \$1 per ton extra for gas pipe.

Old Material.—Local dealers have been able to dispose of their stock at about the same rate at which shipments are received, but the margin in prices is very narrow and the market as a whole in a very unsatisfactory condition. There are no indications at this time for an increase in the consumption, with the supply already on hand comparatively large. We quote dealers' asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles.....	\$16.50 to \$17.00
Old iron rails.....	12.50 to 13.00
Old steel axles.....	16.00 to 16.50
No. 1 railroad wrought.....	11.50 to 12.00
No. 2 railroad wrought.....	9.00 to 9.50
No. 1 country wrought.....	8.50 to 9.00
No. 2 country wrought.....	8.00 to 8.50
No. 1 machinery.....	10.00 to 10.50
No. 1 steel.....	9.00 to 9.50
Tram car wheels.....	9.50 to 10.00
Standard car wheels.....	11.00 to 11.50
Light cast and stove plate.....	7.00 to 7.50

Cleveland

CLEVELAND, OHIO, August 9, 1910.

Iron Ore.—Ore shipments down the lakes during July were 6,945,289 tons, which is a falling off of only 371,303 tons as compared with the heavy movement during June. Although many furnace interests are not ready to take their ore, mining companies will not delay in moving the tonnage that has been sold down the lakes. It is expected, however, that there will be an early closing of shipments in the fall. In view of the market conditions, further sales are not looked for. We quote ore prices as follows: Old Range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old Range non-Bessemer, \$4.20; Mesaba non-Bessemer, \$4.

Pig Iron.—The Canton, Ohio, consumer that had an inquiry out last week for 10,000 tons of basic for the last quarter is understood to have bought 5000 tons from a Valley interest at about \$14.25, Valley furnace. The sale of some small lots of foundry iron is reported, but buyers, who have been feeling the market for lots of 500 tons and over, are still holding off. There is almost a total absence of local inquiries, the few sales reported being for outside shipment. Local prices are somewhat softer, and the \$14 quotation in the Valley for No. 2 appears to have become more general. There is a feeling that prices will go no lower, but buyers think they can do as well by waiting, and those not in need of iron are in no hurry to buy. Reports indicate that most foundries have small stocks in their yards. For prompt shipment and the last half we quote, delivered, Cleveland, as follows:

Bessemer	\$16.15 to \$16.40
Northern foundry, No. 1.....	15.25 to 15.50
Northern foundry, No. 2.....	14.50 to 14.75
Northern foundry, No. 3.....	14.25 to 14.75
Gray forge.....	14.15 to 14.25
Southern foundry, No. 2.....	15.35 to 15.85
Jackson Co. silvery, 8 per cent. silicon.....	19.25 to 19.50

Coke.—Buying by the foundry trade for its requirements for the last half and in many cases for the first half of next year, which has been quite active for several weeks, has dropped almost entirely off and it is believed that nearly all of the foundrymen are now under contract. There is no demand for furnace grades. We quote standard Connells-ville furnace coke at \$1.00 to \$1.65 per net ton, at oven, for spot shipment, and \$1.80 to \$1.85 for the last half. Connells-ville 72-hour foundry coke is held at \$2.15 per net ton, at oven, for spot shipment, and \$2.25 to \$2.50 for the last half.

Finished Iron and Steel.—While no large orders are coming out, the demand for small lots is quite active. Some of the mill agencies report an improvement in this respect. Consumers' stocks are reported to be generally low and early shipment is wanted on nearly all orders. Lower price quotations on steel bars have been quite generally met by all the mills, so that the ruling quotation now is 1.40c., Pittsburgh, for carload lots and over. The bolt and nut trade is somewhat quiet at present, but consumption by other manufacturers appears to be well maintained. In some cases shipments have been held up, but these are mostly from the automobile trade. The demand for iron bars is only fair and prices are not firm. The usual quotation of 1.40c., at mill, can be shaded on desirable orders. The demand for plates and structural material in small lots is good. Boiler and tank shops in this territory are quite busy, and local

fabricating shops are well filled with work. Among new structural inquiries is one from the Detroit, Toledo & Iron-ton Railroad for 1400 tons for bridge work, and a round tonnage for a new building to be erected by the Dime Savings Bank in Detroit, for which Bethlehem sections will probably be used. Plates and structural material are firm at 1.40c., Pittsburgh. While there is a fair demand for sheets some of the mills are eager for orders, and the usual quotation on No. 28 of 2.20c. for black and 3.30c. for galvanized can probably be shaded on desirable business. The demand for twisted bars for concrete reinforcement is quite heavy, and is expected to continue good during the remainder of the building season. While warehouse business has fallen off somewhat, jobbers are still getting a fair volume of orders.

Old Material.—Local mills are buying only in small lots for immediate needs, purchases being mostly what is offered them at bargain prices. There are good sized stocks in some of the yards, which are being held for firmer prices. There is no demand from foundries. Owing to the absence of transactions some quotations are merely nominal. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails.....	\$14.00 to \$14.50
Old iron rails.....	16.00 to 16.50
Steel car axles.....	20.00 to 20.50
Heavy melting steel.....	13.00 to 13.25
Old car wheels.....	14.00 to 14.50
Relaying rails, 50 lb. and over.....	22.50 to 23.50
Agricultural malleable.....	12.00 to 12.50
Railroad malleable.....	13.00 to 13.50
Light bundled sheet scrap.....	9.00 to 9.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles.....	\$21.00 to \$21.50
Cast borings.....	5.50 to 6.00
Iron and steel turnings and drillings.....	6.75 to 7.25
Steel axle turnings.....	9.00 to 9.50
No. 1 busheling.....	11.00 to 11.50
No. 1 railroad wrought.....	13.00 to 13.50
No. 1 cast.....	11.50 to 12.00
Stove plate.....	10.50 to 11.00
Bundled tin scrap.....	11.00 to 11.50

New York

NEW YORK, August 10, 1910.

Pig Iron.—A number of inquiries have been before local sales offices in the past week, and business has been closed in lots running up to 500 tons in foundry iron, with several transactions involving 1000 tons or more each still pending. The chief inquiry of the past fortnight has come from a railroad equipment interest having a number of foundries, and a total of several thousand tons is involved, deliveries for both the last quarter of 1910 and the first quarter of 1911 being asked. It is understood some of the iron for this year has been placed. In New England some business has been done with malleable and gray iron foundries, particularly in Connecticut. Considerable activity is reported in iron from the Buffalo district, Eastern buyers so located as to be reached by water taking advantage of shipment by the Erie Canal, \$15.75 and as low as \$15.50, at points on the Hudson and on Long Island Sound being possible on deliveries before the close of navigation. In the close competition over some recent business low figures are heard. Pipe foundries continue to make offers for Northern irons, representing some of the lowest quotations for Southern irons plus freight, but Pennsylvania and New Jersey furnaces are not yet down to such a level apparently. Some water pipe and soil pipe foundry buying is reported, including one fair sized lot for Brooklyn delivery. We quote Northern foundry iron at tidewater as follows: No. 1, \$16, to \$16.25; No. 2 X, \$15.75 to \$16; No. 2 plain, \$15.25 to \$15.50. On Southern iron quotations are \$15.75 to \$16 for No. 1 and \$15.25 to \$15.75 for No. 2.

Finished Iron and Steel.—The falling off in building operations in the East is rather more pronounced, and little important new inquiry has come to the fabricating companies in the past week. The 10,000 tons for the New York Central terminal work is not formally awarded, but it is expected the announcement will be made within the week. Railroad inquiry is coming in for such a variety of small lots as to indicate that absolutely nothing is being placed that can be dispensed with, the inquiries ranging from 10 tons upward. The largest is for 500 tons of track elevation work for the Pennsylvania lines West. The pending estimates in this connection are for the Chesapeake & Ohio, Baltimore & Ohio, Central of New Jersey, Reading, Boston & Albany, Boston & Maine, Pennsylvania Railroad, New York Central, St. Paul and Missouri Pacific. The principal inquiry from the Pacific Coast is for the Corlett Building at Seattle—1900 tons. The American Bridge Company has received the contract for mill buildings for the Michigan Alkali Company, Wyandotte, Mich., requiring about 1000 tons of steel. The Kern county court house, California, 500 tons, was taken by L. Shreiber & Sons, Cincinnati. The new First National Bank at Lincoln, Neb., 600 tons, will be fabricated by the Noelke-Richards Company, Indianapolis.

THE IRON AND METAL MARKETS

Excellent specifications are being received for steel bars and new orders for bar iron are more numerous. The leading bar iron mills have booked some good orders from railroad companies for delivery over the remainder of the year, understood to be at a slight concession from recent prices. It is reported that the bar iron trade is being canvassed with a view to endeavoring to reorganize the old Bar Iron Association. Quotations are as follows: Plain structural material and plates, 1.61c. to 1.66c.; steel bars, 1.56c. to 1.61c.; bar iron, 1.45c. to 1.50c., all New York.

Cast Iron Pipe.—Sharp competition developed in the placing of the Boston contract for 500 tons of water pipe on Tuesday. The lowest bidder named \$21.89 per net ton, delivered. The next lowest bidder was \$1.50 above this price. General business continues exceedingly dull. Car-load lots of 6-in. are quoted at \$23.50 to \$24 per net ton, tidewater.

Steel Rails.—Very few sales have been made. The Carnegie Steel Company has booked 500 tons for the Philadelphia & Reading Coal & Iron Company and 500 tons for the La Belle Iron Works. The Illinois Steel Company has sold 500 tons to a terminal railroad company.

Old Material.—A very decided lack of interest is shown by consumers and this, together with the numerous and heavy railroad list coming out, is tending to depress the market still further. Steel scrap in eastern Pennsylvania is now so low that the price offered there is about \$1 per ton less than is now prevailing in the Pittsburgh district. This condition of affairs has largely been brought about by the buying through one agency for most of the steel works and the principal iron rolling mills. While present conditions are discouraging, dealers are inclined to believe that something of a buying movement must shortly develop, as general business conditions are by no means unfavorable, and if any trade is to be done this fall it cannot long be postponed. While buyers in actual need of material may be obliged to pay somewhat higher prices, the market per gross ton, New York and vicinity, appears to be as follows:

Rerolling rails.....	\$12.00 to \$12.50
Old girder and T rails for melting.....	11.00 to 11.25
Heavy melting steel scrap.....	11.00 to 11.25
Relaying rails.....	20.50 to 21.50
Standard hammered iron car axles.....	21.50 to 22.00
Old steel car axles.....	16.50 to 17.00
No. 1 railroad wrought.....	12.75 to 13.25
Wrought iron track scrap.....	11.50 to 12.00
No. 1 yard wrought, long.....	11.50 to 12.00
No. 1 yard wrought, short.....	11.00 to 11.50
Light iron.....	5.00 to 5.50
Cast borings.....	7.00 to 7.50
Wrought turnings.....	7.50 to 8.00
Wrought pipe.....	11.00 to 11.50
Old car wheels.....	12.50 to 13.00
No. 1 heavy cast, broken up.....	11.00 to 11.50
Stove plate.....	9.00 to 9.50
Locomotive grate bars.....	9.00 to 9.50
Malleable cast.....	12.00 to 12.50

The German Iron Market

BERLIN, July 29, 1910.

The theory that the isolated furnaces would be frightened into making terms with the new syndicate builders seems to have some substance to it. At any rate, it is now announced that the furnaces of the great Rhenish-Westphalian district, with the exception of a few unimportant concerns, have reached a basis of agreement for a new organization.

On the Duesseldorf Exchange recently the trading in iron products brought out a somewhat lower price for one grade of pig, as well as a drop of several marks on plates of the thinner numbers. The market for tubing has been badly shaken up by the dissolution of the trade combinations at the beginning of this month; prices are considerably lower. There appear to be marked differences of opinion as to the further development of prices in general. It is asserted in some of the trade reports that manufacturers are disinclined to take orders at existing prices, but the same reports point out that dealers and consumers are holding back orders with the expectation of forcing price concessions later. It is a remarkable fact that prices have kept up much better in Germany than in the United States, England and Belgium. Trade reports emphasize the fact that Germany is the only country that still has higher iron and steel prices than at the beginning of the year.

The Steel Syndicate held its regular monthly meeting July 21 and gave out a rather cheerful report. It says in respect to semi-manufactured products that there has been no marked change of conditions since last month, and that specifications on orders already sent in are arriving at a satisfactory rate; the foreign trade continues quiet. As to steel rails, it is mentioned that the Prussian railroads have now given their last orders for this year, and these fall more than 40,000 tons short of even the reduced quantity ordered last year. Better prospects are reported for grooved rails, as numerous municipal and other building projects are in

view; some big foreign orders have also recently come in. Rails for mines are in good demand, particularly for the foreign market, but Belgian competition in this specialty is sharp and disturbing. The settlement of the lockout in the building trades has given a good impetus to the demand for structural shapes, and the foreign market has continued satisfactory.

Metal Market

NEW YORK, August 10, 1910.

THE WEEK'S PRICES

Copper.—Cents Per Pound.				Lead.—		Spelter.—	
August.	Lake.	Electro-lytic.	Tin.	New York.	St. Louis.	New York.	St. Louis.
4....	12.75	12.50	33.12½	4.40	4.25	5.20	5.05
5....	12.75	12.50	33.25	4.40	4.30	5.20	5.05
6....	12.75	12.50	33.25	4.40	4.30	5.20	5.05
8....	12.75	12.50	33.20	4.40	4.30	5.20	5.05
9....	12.75	12.50	33.25	4.40	4.30	5.20	5.05
10....	13.00	12.62½	33.37	4.40	4.30	5.20	5.05

Copper advanced this morning, the market having greatly strengthened. The tin market is strong, and it is thought that there will be a shortage of stocks during the present month. Lead is firmer and outside sellers are asking better prices. The price of spelter is being firmly held, but consumers are taking little interest in the market.

Copper.—Since the publication of the producers' statistics for July, which showed the consumption to be larger than generally expected, the London market has advanced more than £5. There have been sales in this country of some good round lots of copper for export during the week, and although up to noon to-day an important sales agency was offering electrolytic at 12.50c., the market in other quarters had advanced to 12.62½c. As it is a question whether the seller referred to would accept any great amount of business at 12.50c., the market should be quoted at the higher price, 12.62½c. The price of lake copper began to advance yesterday afternoon, and this morning most of those who had any to offer were naming 13c. All things considered, the producers' statistics, published elsewhere, were very favorably received in the trade, and the copper market has an undertone of confidence that is encouraging to the sellers. Outside of the sales for export, consumers have not actively taken hold as yet, but, as many of them have been placing orders for smaller lots than they ordinarily buy, it is thought that a consuming demand is developing fast. In London to-day the market closed with spot copper selling at £56 2s. 6d. and futures for £56 18s 9d. The sales amounted to 800 tons of spot and 3100 tons of futures. The market was firm.

Pig Tin.—The pig tin market was not very active the past week until yesterday, when a good demand developed and about 200 tons changed hands. It is apparent that there will be a shortage before the month is out, although it is not thought that the stocks will be so tightly cornered as during the latter part of last month. On August 1 the stocks on hand were shown to be 693 tons, and so far this month the arrivals have been 2053 tons, while of the 2330 tons afloat it is expected that at least 1325 tons will arrive. This would indicate that there will be during the month about 4071 tons in sight, which, at the present rate of consumption, will only about suffice for the current demand, as consumers have bought very sparingly of late because of the corner. Some large buyers have covered themselves by placing orders in advance and this will prevent available stocks from being so closely concentrated. Tin sold in New York to-day for 33.37c. The London market closed with spot tin selling at £152 10s. and futures for £152 7s 6d. The sales amounted to 220 tons of spot and 370 tons of futures. The market was steady.

Tin Plates.—While the demand for tin plates is rather quiet, the mills are still behind in their deliveries. The price in New York for 100-lb. coke plates is \$3.84. The recent advance of 1½d. in the price of Swansea plates is still maintained.

Lead.—The lead market has strengthened and in St. Louis the metal is costing five points more. The American Smelting & Refining Company is offering it in the New York market at 4.40c., but outside sellers are asking from 4.45c. to 4.50c. In St. Louis this company, which usually quotes the market 15 points under the New York price, has advanced its quotations to 4.30c., and other sellers are naming the same figure. In other parts of the country it is asking relatively more for lead than in New York. For instance, in New England, where the freight rates would make the price two points higher than at New York, the price named is four to six points above the New York price. It is thought in many quarters that there will shortly be an advance all along the line.

Spelter.—Buyers are taking little or no interest in the spelter market. There have been reports of some shading of

THE IRON AND METAL MARKETS

prices, but careful investigation fails to disclose anything to warrant the rumor. As a matter of fact, very little spelter is being taken. We quote 5.20c., New York.

Antimony.—Prices continue weak and few sales are being made. The nominal price for Cookson's is 8.25c. Hallet's is selling at 8c. Other brands can be had around 7.50c.

Old Metals.—The market is quiet. Dealers' selling prices are unchanged, as follows:

	Cents.
Copper, heavy cut and crucible.....	12.25 to 12.50
Copper, heavy and wire.....	11.75 to 12.00
Copper, light and bottoms.....	11.00 to 11.25
Brass, heavy.....	8.75 to 9.00
Brass, light.....	7.00 to 7.25
Heavy machine composition.....	11.25 to 11.50
Clean brass turnings.....	8.00 to 8.25
Composition turnings.....	9.50 to 9.75
Lead, heavy.....	4.05 to 4.20
Lead, tea.....	3.80 to 3.95
Zinc scrap.....	4.15 to 4.25

Metals, Chicago, August 9.—There has been good consumptive buying of copper in this market for deliveries running through September and in some cases into October. Casting copper is a shade stronger, but the quotation of lake in the Chicago jobbing trade remains unchanged. Not much demand is reported for spelter, on which the price remains practically the same, some sales of single carloads running as high as 5.25c. Lead is unchanged. Tin is still quoted at 34c. for spot delivery, and the concession for shipment during the latter half of August is narrowed to about ¼c. We quote Chicago prices as follows: Casting copper, 12½c.; lake, 13c., in carloads, for prompt shipment; small lots, ¼c. to ¾c. higher; pig tin, car lots, 34c.; small lots, 35c.; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.15c. to 5.20c.; Cookson's antimony, 10¼c., and other grades, 9c. to 10c.; sheet zinc is \$7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10½c.; copper clips, 11½c.; red brass, 11½c.; yellow brass, 8½c.; light brass, 6c.; lead pipe, 4¼c.; zinc, 4½c.; pewter, No. 1, 24c.; tin foil, 26c.; block tin pipe, 30c.

Metals, St. Louis, August 8.—Lead is quiet, at 4.30c.; spelter is steady, at 5c. to 5.05c., East St. Louis. Zinc ore is held at \$38 to \$40 per ton, Joplin base. Tin is quoted at 33.85c. per pound; antimony, 8.50c.; lake copper, 13.15c.;

electrolytic, 12.95c., all at St. Louis. There was a fair demand for finished metals the past week and the outlook is favorable for business for the month.

Iron and Industrial Stocks

NEW YORK, August 10, 1910.

The stock market has been fairly well sustained since last week's report by the rather cheerful news coming from the Western agricultural districts. Quite a confident feeling now prevails that the staple crops of the country will not fall much below the average. With fears of an actual crop failure allayed, one feature of possible business disturbance has been removed, and this in itself is of much importance. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows, the highest prices of this period having usually been reached on Tuesday:

Allis-Chalm., com...	8½ - 8¾	Pressed St., pref...	94 - 94½
Allis-Chalm., pref...	27 - 28	Railway Spr., com...	30 - 32
Can. com.....	7½ - 8½	Republic, com.....	28½ - 30
Can. pref.....	65½ - 68	Republic, pref.....	80¾ - 91
Car & Fdry, com...	44½ - 46½	Sloss, com.....	56 - 61
Car & Fdry, pref...	109 - 109½	Sloss, pref.....	111 - 116½
Steel Foundries....	42½ - 44½	Pipe, pref.....	55
Colorado Fuel....	26½ - 29½	U. S. Steel, com...	67 - 70
General Electric....	139½ - 143½	U. S. Steel, pref...	114½ - 116
Gr. N. ore cert....	51 - 53½	Westinghouse Elec.	55 - 62
Int. Harv., com...	87½ - 90½	Am. Ship, com....	79½ - 80
Int. Harv., pref...	117½ - 119½	Am. Ship, pref....	107
Int. Pump, com...	38½ - 40½	Chi. Pneu. Tool...	32 - 35
Int. Pump, pref...	79½ - 81	Cambria Steel....	41 - 42½
Locomotive, com...	34 - 37½	Lake Sup. Corp....	18½ - 19½
Locomotive, pref...	102½ - 105	Crucible St., com...	10 - 11½
Nat. En. & St., com.	15½ - 15¾	Crucible St., pref...	72½ - 74½
Pressed St., com...	30½ - 34½	Harb.-W. Ref., pref...	92½

Dividends.—The Niles-Bement-Pond Company has declared the regular quarterly dividends of 1½ per cent. on the common and preferred. The preferred dividend is payable August 15. The common dividend is payable September 20.

The Pratt & Whitney Company has declared the regular quarterly dividend of 1½ per cent. on the preferred stock, payable August 15.

The Sloss-Sheffield Steel & Iron Company has declared the usual quarterly dividend of 1¼ per cent. on the common stock.

Canadian Machine Makers Combine.—Concerning the merger comprising practically all the companies in Canada that manufacture the lighter grades of wood-working machinery and tools, Consul James M. Shepard quotes the official announcement: "The new company will be known as the Canada Machinery Corporation, Ltd., and with its headquarters at Galt, Ont., will comprise MacGregor, Gourlay & Co., Ltd., Galt, Ont.; John Ballantine & Co., Ltd., Preston, Ont.; Hespeler Machinery Company, Ltd., Hespeler, Ont., and the woodworking machinery departments of Goldie & McCulloch Company, Ltd., Galt, Ont., and the Sussex Mfg. Company, Ltd., Sussex, N. B. The capitalization of the new company will be as follows:

	Authorized.	Now issued.
First mortgage, 6 per cent. bonds.....	\$1,000,000	\$400,000
Preferred stock, 7 per cent. cumulative..	1,500,000	850,000
Common stock.....	1,500,000	625,000

Russia's scourge, the cholera, continues to spread with most alarming rapidity, particularly in the southern mining districts and in St. Petersburg, where the epidemic is fast approaching the proportions of the great epidemic of 1908. A report from the United Mine Owners' Association, covering 48 mines and 4 foundries, gives 2970 cases and 1250 deaths. The extent of the panic among the miners is shown by figures furnished from 18 mines, from which 18,000 of the 46,000 employees have fled. The panic threatens to stop the production of coal and iron in South Russia.

A special convention of the United Mine Workers of America has been called to meet at Indianapolis, Ind., beginning Thursday, August 11. The conditions that have brought about the necessity for the special meeting have arisen chiefly in Illinois by a conflict be-

tween International President Thomas L. Lewis and Illinois District President John H. Walker, who, it is alleged, has refused to abide by the decision of the International Executive Board in dealing with the Illinois situation. On the other hand, several Illinois local unions have passed resolutions that President Lewis has "wilfully and maliciously prolonged the miners' strike in Illinois." Danger to the organization has also arisen, Mr. Lewis says, in several districts of the Southwest, where mines are preparing to continue work under the "open shop" rule and this "serious situation" must be dealt with by the convention.

The Canadian Trade Commissioner at Leeds, England, has forwarded to the Department of Trade and Commerce at Ottawa certain facts that will be of interest to Canadian and American rail manufacturers. Upon the desire of the India Council, the British Government, which insisted on the use of a higher grade of railroad material upon its lines, obtained quantities of rails from Canada and the United States for purposes of testing. So far, it is stated, the tests have been in favor of the Canadian rails.

Hall Furnace of the Republic Iron & Steel Company, Sharon, Pa., was blown in last Monday. During the six weeks' shutdown the furnace was thoroughly relined, and is in condition for a long and steady run.

The No. 6 furnace of the Thomas Iron Company, Hokendauqua, Pa., was blown out July 17. On August 1 the company had five furnaces in blast at its Hokendauqua, Island Park, Lock Ridge and Hellertown plants.

The Machinery Markets

The machinery trade is generally quiet, but there is so much good business in sight in most of the machinery centers that the market has a cheerful tone. Cancellations on the part of automobile supply manufacturers, which are somewhat prevalent just now, have done little else than reduce the delivery terms on some machine tools which have been so greatly in demand that the makers were from four to six months behind in their orders. From all reports, it is apparent that there are no large lists before the trade throughout the country, but a satisfactory business is being done in the way of single orders and orders for small lots. In the East there are a number of large projects in formulation that will call for heavy machinery expenditures in the fall. Reports from Chicago indicate that the trade is very quiet there, but several large railroad shops in that vicinity are in course of construction and later will have to be equipped. In Milwaukee a slight improvement is felt in the machinery market, and there is some good business in sight. In Pittsburgh inquiries are much more liberal than they were a month ago, and an excellent export trade has been done there. Boiler and locomotive shops are also making good purchases in that market. The outlook is good on the North Pacific Coast and in the Southwest, but business at present in those territories is rather quiet. In the Northwest there is a good demand for quarrying equipment and concrete machinery, as there is a great deal of construction work going on in that territory. The market in the farther Central West has not developed much activity of late, but a good fall trade is expected. Business has picked up slightly in Detroit during the last week, and a good month is expected in that market. Lack of demand from the railroads has contributed toward making the Philadelphia market rather dull during the last week.

New York

NEW YORK, August 10, 1910.

The machinery trade in the Manhattan territory is more quiet than it has been in the last four weeks, and with the exception of some fair sized orders which were placed by the New York Central Railroad during the week no business of any size was done by New York machinery houses. Most of the orders that came to the trade in this territory were for replacements, but there are a number of inquiries in the market which indicate that they will result in liberal buying. A large magneto manufacturing concern with German connections is arranging to build a plant in New England which will be one of the largest factories of its kind in the country, and it is understood that a list of machinery equipment for the enterprise is now in preparation. Nothing has been heard in the trade of the list which was issued by the Delaware, Lackawanna & Western Railroad several weeks ago, but it is understood that the machinery requirements have been listed and placed in the hands of those in charge of the railroad company's purchasing affairs. Notwithstanding the fact that there have been numerous cancellations of orders in the machine tool lines, it is stated by dealers that most manufacturers of milling machines, planers and lathes are still behind in their delivery. The demand for second-hand machinery is somewhat better than the call for new equipment, and good prices are being obtained for used machines, although they are somewhat lower than they were three months ago. Machinery manufacturers find it somewhat easier to place orders for machinery castings, but nevertheless most of the foundries are filled up with work.

The Ottoman-American Development Company has been organized under the laws of New Jersey with a nominal capital of \$500,000 to develop a number of railroad projects in Asiatic Turkey, and it is understood that the company will spend at least \$60,000,000 in a number of enterprises for which it has obtained concessions from the Turkish government. It is understood that the company, in which a number of men well known in the machinery trade in this country are interested, will, in addition to constructing railroads, develop rich mineral and oil fields in the Kurdistan and other sections in the Ottoman empire. Prominent in the affairs of the new company are Charles A. Moore, president of Manning, Maxwell & Moore, Inc.; Arthur F. MacArthur, president of MacArthur Bros. Company; C. M. Chester, Jr., treasurer of Manning, Maxwell & Moore, and E. C. Converse, president of the Bankers' Trust Company, who is also a director in the United States Steel Corporation. It is understood that the company proposes to build several railway systems, which are to be constructed and outfitted with American equipment, and in addition it has a number of mining concessions, some sections of which have heretofore been worked with crude equipment, but which have, however, been bringing good returns. At present plans are being prepared for the first section of the proposed railroad system, which will extend from Sivas, in the province of that name, to the Mediterranean, tapping a number of well populated centers and extending through

some of the country where the company holds mining concessions.

Westinghouse, Church, Kerr & Co., 10 Bridge street, New York, have been awarded the contract for the construction of an addition to the plant of the American Brake Company at St. Louis, Mo. The addition will include a three-story general factory building 80 x 134 ft., which will cost about \$100,000; a power plant 36 x 60 ft., and an addition to the smith shop which will be 100 x 110 ft. and one story. It is understood that Westinghouse, Church, Kerr & Co. have the general contract for erecting and equipping the structure.

The Climax Lock & Ventilator Company, Buffalo, is arranging to increase its capital stock from \$150,000 to \$250,000, for the purpose of enlarging its plant and manufacturing facilities. Phillip C. Witte is president, 656 Michigan street.

The International Auto League Tire & Rubber Company, recently incorporated at Buffalo with a capital stock of \$1,000,000, to manufacture automobile and automobile tires, appliances and fittings, has broken ground for its factory building at Akron, Ohio. The directors are Alfred C. Bidwell, Wm. Preiss and Chas. H. Bowe, 72 Pearl street, Buffalo, at which location the Buffalo branch office and salesroom will be maintained.

The F. J. Lederer Company has been incorporated at Buffalo, with a capital stock of \$30,000, to manufacture air brushes, spindles, &c. The directors are Frederick J. Lederer, Frank F. Blessing and Henry G. Bentz.

The Rensselaer Mfg. Company, Cohoes, N. Y., has work under way on its new factory building and will soon let contracts for the interior work and equipment.

Bids are being received by supervising architect Henry L. Spann, 38 Pascal street, Buffalo, N. Y., for power plant with equipment, to be added to the Mother House of the Sisters of Mercy, now being erected at Abbott road and Red Jacket parkway at a cost of \$350,000.

The U. S. Hoffman Company, Rochester, N. Y., has commenced work on the three-story and basement factory, 50 x 150 ft., it is to erect on Temple street, for the manufacture of clothes pressing machinery.

The Rochester Trolley Guard & Fender Company has been incorporated at Rochester, N. Y., with a capital stock of \$50,000, to engage in the manufacture of appliances for trolley cars. The incorporators are W. F. Reichenbach, A. A. Prebler and C. W. Henning.

The Bayonne Casting Company, Bayonne, N. J., distributor of monel metal rods, is now running on full time making monel metal castings at its new plant, which was recently equipped for manufacturing special castings in monel metal. Among recent contracts taken by the company is one for two 8000-lb. propellers for the United States battleship Florida, and 12 propellers weighing 16,000 lb. each for the Argentine Republic warships, now in course of construction in this country. This is the largest contract ever taken for monel metal castings.

Port Arthur, Canada, will increase its pumping capacity by a motor driven centrifugal pump, which is necessitated by the rapidly increasing population and the decision of the Dominion Government to locate a large fish hatchery there and take its water from the city's water supply.

The Coldwell Lawn Mower Company of Newburgh, N.

THE MACHINERY MARKETS

Y., has begun work on an additional warehouse at Newburgh, which will be a three-story structure, 100 ft. square.

The Stahlbrodt Company, which was recently incorporated at Rochester, N. Y., was not organized to manufacture wind shields, as was at first announced, but was formed to protect in this country patents covering the manufacture of the zigzag shield, which is now made in Great Britain.

Chicago

CHICAGO, ILL., August 9, 1910.

The machinery trade remains very quiet, with scarcely enough business going to pay running expenses. The factories are more fortunately situated than the dealers during a dull summer market like the present season, as the majority of the manufacturers booked enough business during the spring to run them through the summer, while the dealers have to wait patiently when they encounter a streak of lean in the market. Many important factors have contributed to disturb the buying of machine tools. The financial and banking situation this summer has discouraged extensions and new enterprises. There has been enough speculative news on the crops to promote doubt, especially regarding the corn crop, and the railroads have persisted in their policy of doing no buying that could be postponed until the rate question is settled. All these conditions have had a tendency to check the buying of new tools and shop equipment. The dealers, however, report a slight improvement this week in the amount of business done and when the pendulum swings back again they are confident of having quite a rush of new business. During the past two years the trade has been coming up slowly in alternate periods of activity and dullness. Each active period has developed a larger amount of business than the one that preceded it, and if this condition holds true when business picks up this fall a dull summer will soon be forgotten. Several large railroad shops that are under course of construction in the West will require large lists of tools to equip them and there will undoubtedly be a rush of scattering orders from the railroads as soon as the embargo on their purchasing departments is raised.

The Root & Van Dervoort Engineering Company, East Moline, Ill., has increased its capital stock from \$250,000 to \$1,000,000 and increased its number of directors from four to five.

The Loshbough & Jordan Tool & Machine Company, Elkhart, Ind., has been incorporated with a capital stock of \$5000. The incorporators are J. E. Loshbough, J. C. Jordan, R. M. Loshbough and M. M. Jordan.

The National Mfg. & Lock Company, Chicago, has increased its capital stock from \$100,000 to \$131,000.

The Clark-Smith Hardware Company, Peoria, Ill., has been incorporated with a capital stock of \$160,000 to do a general manufacturing and merchandise business. The incorporators are Frank E. Smith, Amanda A. Foster and George T. Page.

The Barnes Drill Company, Rockford, Ill., is transferring its equipment to the new plant recently completed, where it will be able to handle a larger volume of business. Electric power for the operation of the new plant will be secured from outside sources, but the company is figuring on installing a boiler to be used for heating purposes and of sufficient size to produce from 75 to 100 hp. All new tools and machinery required have been purchased.

The C. E. Bonner Mfg. Company, Chrisman, Ill., will remove its plant and business to Champaign, Ill., where it is having a new factory building erected.

The Ingersoll Milling Machine Company, Rockford, Ill., is contemplating improvements to its Rockford plant, details of which have not been worked out.

Thomas & Clarke, Peoria, Ill., are having plans prepared for a new cracker factory to be erected at a cost of about \$125,000. The plant is to be completed by January 1 and will be operated by electric power secured from the local electric company.

The Rayfield Motor Company, Springfield, Ill., has increased its capital stock from \$74,000 to \$150,000 and will make extensive improvements.

The Union Drop Forge Company, Chicago, has awarded to the Kenwood Bridge Company, Chicago, the general contract for the construction of a drop forge plant which includes hammer shop, 71 x 400 ft.; machine shop, 52 x 380 ft.; board drop, 75 x 400 ft.; cutting and storage shop, 48 x 96 ft.; shipping building, 48 x 96 ft., and an engine and boiler room, 49 x 82 ft.

The Streeter-Ames Weighing & Recording Company, Chicago, has plans prepared for a manufacturing building, 165 x 310 ft., to be erected at the northeast corner of Ravenswood Park and Belleplaine avenue.

Bids will be received until August 15 by the city of

Chicago Heights, Ill., for new equipment to be installed in the pumping station. W. E. Lennertz is city clerk.

The Union Pacific Railroad Company has awarded a contract to the George B. Swift Company, general contractors, Chicago, for the construction at Omaha, Neb., of a planing mill building, 90 x 302 ft. The building will be of steel frame construction, with brick walls.

Philadelphia

PHILADELPHIA, PA., August 9, 1910.

The local market has been quite dull, transactions during the week being small and, as a rule, unimportant, while inquiries have shown a decrease. The effect of the usual vacation period has been pronounced, and the trade generally finds it difficult to close up pending business. The railroad demand is still quiet, no new inquiries being reported by local merchants. There is a considerable quantity of prospective business in sight, and, while the trade scarcely expects any important developments during the current month, more active conditions are anticipated during September and October.

Manufacturers of tools and machinery generally continue operating their plants to comparatively full capacity. In many cases orders on hand are reported sufficient to keep them so engaged from three to six months ahead, but new business is reported as being very light. In a number of cases the month of July was said to have been fairly good in point of orders, but sales have been largely to consumers at distant points, rather than in this vicinity, and confined particularly to special equipment and machinery, rather than the usual line of machine tools. Some little business in the way of equipment for export is heard of, but the demand is irregular and by no means large.

In the second-hand machinery market business drags, reflecting the general condition of the trade. A pretty good demand for machinery castings is reported, both in iron and steel, but there is little large business being placed and foundries as a rule have less forward business on their books. While the demand for boilers, engines and general power equipment has not been large, there is a fair volume of business pending, mostly, however, in the small and medium horsepower.

The A. P. Wittman Company is making considerable improvement to its forge shop at Chester, Pa., a structural steel extension, 60 x 100 ft., being added, giving a total length of 140 ft. As soon as the new portion is completed the old shop will be torn down and the structural steel extension continued, replacing the old shop. The equipment for the addition is, we are informed, practically all purchased, the better part of that recently acquired by the purchase of the entire equipment of the Portsmouth Forge Company, Portsmouth, N. H., will be used in the new addition.

Ballinger & Perrot, architects and engineers, have completed plans and specifications and awarded a contract to Appleton & Burrell, for a fireproof addition to the machine shop of Hugo Bilgram, Spring Garden street, below Thirtieth street. The new addition will have a frontage of 40 ft., and 78 ft. deep, with an L 21 x 30 ft. It will be two stories, of fireproof construction, and conform in design to the present building. This contract is in addition to that for a power house for the same concern, contract for which was recently awarded. Ballinger & Perrot have also completed plans for the erection of a new fireproof manufacturing building, which will replace that of the Ehret Magnesia Covering Mfg. Company at Port Kennedy, Pa., which was recently destroyed by fire. The building will be three stories and 67 x 256 ft. on the ground plan. The contract for the building has been let and work will be started at the earliest convenience.

The Premier Metals Company, Camden, N. J., has been incorporated under the Jersey laws with a capital of \$50,000, for the purpose of dealing in metals. William T. Wycoff, R. M. Hilands, L. H. Schmidt and A. L. Wheatlors are named as the incorporators.

The Engineering & Contracting Company, Baltimore, Md., has been awarded the contract for a five-story addition, 45 x 92 ft., to the department store of A. A. Brager, 225 and 227 Eutaw street, in that city. The building will be of fireproof construction.

Preliminary estimates on the buildings and piers to be erected in connection with the new emigrant station for the Port of Philadelphia, at Gloucester, N. J., will, it is stated, be shortly ready for submission to the Department of Commerce and Labor. Plans call for a 250-ft. pier and a main building, 100 x 230 ft., in addition to which there will be separate buildings and a power house.

The contract for the power house to be erected for the Stephen Girard Estate at Twentieth and Oregon streets has been awarded the Pomeroy Construction Company. It

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will be 37 x 87 ft., of brick and reinforced concrete, from designs by J. R. Windrim. The Girard Estate already has one such plant in operation, and the second one will be used for the same purpose, that of supplying heat, light and power to groups of residences erected in the vicinity.

Sealed proposals will be received until August 15 by A. F. Hammond, superintendent of supplies, Board of Education, First School District of Pennsylvania, for a quantity of supplies, among which are included electric lamps, scientific department materials, engineers' transit, patternmakers' face lathe, drilling and grinding machine, dies and taps, speed lathe, electric fans and other materials and equipment. Specifications, samples and full list of articles can be seen and further information obtained by applying to room 392, City Hall.

Plans completed by Zatzinger, Borie & Medary, associated architects, and accepted for the group of house buildings for the Grand Lodge of Free and Accepted Masons of Pennsylvania, to be erected at Elizabethtown, Pa., include a mechanical plant, consisting of one or more buildings, to provide heat and light for the entire group and power for the laundry and the ventilating systems. It will also include refrigerating machinery, repair shops for engineer, carpenter, electrician and blacksmith, incinerating ovens and cold storage facilities. Boiler house, engine and dynamo room, pumping station and a water tower are provided for.

Dodge & Day, engineers, are taking bids for buildings for an addition to the plant of the Watson Wagon Company, Canastota, N. Y. Those for the buildings, which include a three-story paint shop and manufacturing building, dry kilns and a wheel stock storehouse, will be opened August 15, at Canastota, N. Y. Some small power equipment, including a 75-kw. generator set and additional wood-working machinery, will be taken up at a later date. This firm of engineers is engaged on plans for several other large plants, details of which are not yet ready for announcement.

Manufacturers here are reported to be figuring on equipment for a generating station to be erected by the Jenkins Electric Company, recently organized by J. H. Glennon and others of West Pittston, in Pittston, Pa.

The Chester Shipping Company, Chester, Pa., has, it is stated, awarded a contract to John J. Williams & Co. of that city for the erection of an extensive concrete pier at the foot of Market street. It is proposed to erect a steel frame warehouse, two stories, 200 ft. long, on the new pier.

Henry Disston & Sons, Tacony, have awarded the contract for a new cold rolling mill, previous mention of which has been made in these columns, to the Charles McCaul Company. The building is to be of brick and measure 51 x 288 ft. on the ground plan.

Plans are prepared and have been practically approved by city engineers for the elevation of tracks of the Philadelphia & Reading Railway, from Somerset street to the Port Richmond coal wharves. This will abolish a number of grade crossings and, according to agreement, the expense, which is estimated to be about \$4,000,000, will be divided between the city and the railroad company. It is believed that bids for the work will be advertised in the next week or so.

Pittsburgh

PITTSBURGH, PA., August 9, 1910.

Although irregularity still characterizes the market, the balance of trade in machinery, as compared with other industrial sections of the country, appears to be strongly in favor of the manufacturers and dealers of this district. Inquiries are much more liberal than they were a month ago, and the aggregate of actual bookings must be large for this time of the year. Export trade, which has gradually been gaining, helps the present situation materially, but the heaviest percentage of increase is in domestic business. Orders from the Central West appear to predominate in number, but in point of value Eastern trade shows up very well. Buying for the account of boiler and locomotive shops, tank works, structural iron and steel fabricating plants, sheet metal factories, &c., is again quite a feature of the local market, and letters received by manufacturers from representatives in the West, both north and south of the Iowa-Missouri line, indicate that this will be considerably strengthened by the demand from that section as soon as the crop movement is further along.

One of the surprises of the season is the continued purchasing of machinery for coal mining and handling, as it was thought that the heavy buying, which began early in the spring, would not last very long. The Westinghouse Electric & Mfg. Company, with its affiliated interests, has probably benefited by this trade to a greater extent than any other single interest, for the reason that there has been a notable

movement toward the complete electrification of many important properties; but it has been shared by numerous other manufacturers and supply houses in Pittsburgh, Connelville and neighboring cities. This is so far recognized that several new companies are forming to engage principally in the colliery trade, while others, that have not paid much attention to it heretofore, are arranging for representation in the leading centers of distribution of the coal mining districts.

The market for machine tools and shop equipment in general does not show as much life as other lines that are closely related. In fact, its continued sluggishness is distinctly disappointing. With reference to fall prospects, however, a hopeful feeling prevails, and, with better deliveries than last year, dealers feel that they can do enough business between September 1 and the holidays to foot up a large total for the current season.

Work is just starting on a steel tipple and power house for the Purselove Coal Company of St. Clairsville, Ohio, at Steubenville, Ohio. It is stated that an expenditure of \$250,000 for machinery and buildings will be made.

The Bethlehem Steel Company, South Bethlehem, Pa., has been taking bids on a new shop building, 22 x 80 ft. The contract for constructing the gas engine power plant has been let to the McClintic-Marshall Construction Company, Pittsburgh. The size and equipment have been previously mentioned.

The plant of the Union Spring & Mfg. Company at New Kensington, Pa., is largely occupied at present with orders from electric traction companies, truck builders, &c. One of its specialties is a pressed steel lid used for journal boxes, which is produced in accordance with specifications of the Master Car Builders' Association.

The Wheeling Traction Company, Wheeling, W. Va., has been authorized by the City Council to build a pumping station on the South Side, the purpose of which is not stated.

The municipal power and pumping plant proposed for Etna, Pa., a suburb of Pittsburgh, will not be constructed this year, as a bond issue for the purpose has been defeated.

The Anderson Automobile Company, organized here by John C. Anderson, Harold Allen and R. H. Frank, will make application for a State charter to engage in the manufacture of motor vehicles.

It is announced from Greenville, Pa., that work has been ordered to be started on a new roundhouse, machine shop and air brake shop, steam heating plant, &c., for the Bessemer & Lake Erie Railroad. An expenditure of \$100,000 or more is involved.

The J. S. McCormick Company, Pittsburgh, is finding a large sale among foundries in this district and elsewhere for the Deane pneumatic sand sifter, which it handles. The outlook for fall trade is good.

The Riddle Construction Company, which was recently organized at Johnstown, Pa., by Henry Riddle and others, is preparing to enter the coal mine equipment field and will also engage in various forms of engineering construction work. Plans for a manufacturing plant have not yet, however, been matured.

Manufacturers of this district have been asked for preliminary estimates, it is said, on equipment for the new crucible foundry of the Taylor Steel Company, but it does not appear that any definite lists have been given out, the plans of the company in this particular being still incomplete.

The Quemahoning Coal Company, whose headquarters are at Somerset, Pa., is increasing the capacity of its steam power and compressor plant, the equipment for which has been largely purchased. Additional development work to be undertaken, however, will require some further apparatus later on.

Quite a number of plate punchers, riveters, &c., have been drawn from here lately for work in Eastern shipbuilding plants. From the north Pacific coast there is also a call for this class of labor.

The Pittsburgh Construction Company, Pittsburgh, has the contract for erecting new factory buildings, tanks, &c., for the United States Glass Company, Glassport, Pa.

Among the sales in this district of the Brown Hoisting Machinery Company, whose Pittsburgh offices are in the Frick Building, locomotive cranes for industrial plants, contractors' service, &c., have been more prominent than usual, with promise of an abundance of similar business during the remainder of the year.

The Wright Wrench & Forgings Company has put in operation its new plant at South Canton, Ohio, where its line of products will be considerably enlarged. Forgings for machinery manufacturers, automobile builders, &c., will be a feature of future trade.

Dealers here will be figuring almost continuously for some months on equipment for the new plant of the General Electric Company, at Erie, Pa., which is to be purchased on small lists issued at intervals as construction contracts are let.

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The Pressed Prism Plate Glass Company, Morgantown, W. Va., whose plant is electrically operated, will add somewhat to its machinery during the fall.

As an index of present operations in plants of all kinds where metals are melted or heated for working, it is interesting to note that the present demand for pyrometers is uncommonly heavy.

Larkin & Co., Butler, Pa., machinists and manufacturers of oil well tools, &c., have purchased a strip of land adjoining their plant, on which a new boiler house is to be erected, to contain an 80-hp. Titusville boiler. The present equipment in the machine shop is also to be rearranged, but no new machinery will be purchased at present.

Cincinnati

CINCINNATI, OHIO, August 9, 1910.

As far as machine tool builders are concerned, indications are that the first two weeks of August will be about the same as the corresponding period of July. Enough scattered orders are coming in from the trade generally to keep the machine tool people in an optimistic humor. Recent crop reports appear to have helped along this feeling, and the inquiry is better than had been anticipated. The railroads have done some quiet purchasing lately, and business from the automobile industry has by no means been entirely cut off. While the smaller type of lathes, shapers, milling machines, &c., have been mostly in demand, some recent orders have been booked for the larger sizes of shop tools, which are understood to have been placed by the railroads. As evidence of the fact that machinery manufacturers are busy it is stated, and on good authority, that the consumption of pig iron for the past six months has been greater than ever known for a like period.

Dealers in machine tools and the second-hand machinery people both report business only fair, but state that enough inquiries are coming in to encourage them as to the fall outlook.

A few local foundries and patternmakers could probably take care of more work, but as a general rule they are operating on full time.

The American Valve & Meter Company, whose Cincinnati factory is now located on Gest street, has commenced work on a plant at 2833-49 Spring Grove avenue. The main building will be 62 x 173 ft., with an L 62 x 82 ft., all two stories, and of reinforced concrete construction. The company makes a specialty of switch stands and water columns for railroads, as well as water meters, and its production in the new quarters will be greatly increased. The equipment now in the Gest street plant will be moved, but some additional machinery will have to be provided.

The additions planned to be made to the plant of the Hooven, Owens, Rentschler Company, Hamilton, Ohio, manufacturer of Corliss engines, include two stories to its present pattern shop and also a new building, 69 x 116 ft., four stories, of reinforced concrete construction. A pattern storage warehouse, 50 x 182 ft., one story, is also being constructed. On the completion of these proposed improvements the company will be able to make prompt deliveries on contracts for its well-known engines.

About October 1 the Hisey & Wolf Machine Tool Company expects to occupy its new factory at Colerain avenue and Township street, Cincinnati. Among its recent orders was one from Japan for some of its breast drills.

The Norwood Ice Company of Norwood, a Cincinnati suburb, has been incorporated with \$35,000 capital stock. H. C. Wood, president of the company, is also president of the H. C. Wood Ice Company of Cincinnati. The other incorporators are H. W. Zeigler, C. C. Carpenter, J. T. Maltby and J. S. Gibson. The company will erect a 50-ton ice plant. None of the equipment has been purchased.

John C. Rogers, Provident Bank Building, Cincinnati, is the principal incorporator of the American Railroad Tie Company, and plans are under way for the erection of a plant at a nearby point for the manufacture of a reinforced concrete cross-tie.

The Black & Clawson Company, Hamilton, Ohio, is very busy working on orders for heavy paper machinery. Business recently booked included a large mill from each of the following: The Bryant Paper Company, Kalamazoo, Mich.; River Raisin Paper Company, Monroe, Mich., and the John F. Boyle Company, Jersey City, N. J.

In spite of the fact that the railroads have been slow buyers, the Niles Tool Works Company, at Hamilton, Ohio, is working a full force and plans to keep thus employed the balance of the summer.

A 35-ft. extension was recently completed to the shop of the Long & Allstatter Company, Hamilton, Ohio. The company's records show that orders recently received have

come from varied industries all over the country, as well as some for export. A large, heavy, double punching machine has just been completed for the Norfolk & Western Railroad.

The Globe Steel Company, Mansfield, Ohio, has increased its capital stock from \$5000 to \$30,000.

The H. F. M. Mfg. Company, Akron, Ohio, has now been incorporated and has recently made contract with two outside companies to take its entire output of sheet metal specialties. No additions to its plant are planned.

Littleford Bros., Cincinnati, boilermakers and general sheet iron workers, have recently purchased a lot behind their shop, at 453-57 Pearl street, which will enable them to extend it through to Second street. Building plans have not yet been decided on.

The Foos Gas Engine Company, Springfield, Ohio, has operated night and day without a skip for 10 months except for enforced shutdowns for repairs and holidays. In spite of this the company is still as far behind orders as it was a year ago and reports 1910 the most successful year in its history. It will probably begin soon the erection of a big addition, which will increase its erecting and testing floors to the point where it can take care of its big business without straining its organization on large orders for 25 to 50 of its horizontal engines, besides a large number of its multiple vertical type, in units from 20 to 500 hp.

Sealed proposals will be received by the city of Connersville, Ind., until September 1, 1910, for the furnishing of all material and constructing complete pumping station and other buildings, reservoir, removal of old machinery, laying of water pipes and specials, drilling wells, the furnishing of vertical motors, electrical centrifugal unit, turbine generator unit with surface condenser, &c., and tubular boiler for municipal water works improvements. Bids are to be separate and in full on each class of work as classified in specifications, and bids on a single class or combination of classes may be accepted.

The Ansted Spring & Axle Company, Connersville, Ind., whose plant was destroyed by fire, is erecting a new plant of fireproof construction, which will contain about twice as much floor space as the old plant.

The Brazil Fence Company, Brazil, Ind., has purchased the factory of the Withington Machine & Fence Company, Adrian, Mich., and has moved the equipment to Brazil, where it will be utilized for the manufacture of fence machines.

The Chicago, Burlington & Quincy Railroad Company is considering the construction at Paducah, Ky., of the shops of the Herrin Southern branch of the Burlington System, but we are officially advised that no definite decision has been reached.

The Ayer, McCarel, Regan Clay Company, Brazil, Ind., capital stock \$100,000, has taken over the plant and business of the Indiana Fire Proofing Company at Carbon, Ind., and expects to have it in operation in about 30 days. The plant is fully equipped for the manufacture of fireproofing and drain tile and was built at a cost of \$40,000. The officers of the company are: D. E. Regan, president; J. V. Ayer, secretary and treasurer; W. L. McCarel, vice-president and general manager.

The Maxwell-Briscoe Motor Company, New Castle, Ind., is considering plans for the extension of its plant.

The Bayonet Trolley Harp Company, Springfield, Ohio, at the present rate of demand from electric railway lines, will be obliged to provide for enlarged manufacturing facilities.

F. E. Myers & Bro., Ashland, Ohio, are contemplating extensive improvements, among which will be a new foundry, 140 x 250 ft., for making light gray iron castings. The company expects to let the contract for this building early in the fall.

The Jenne Acetylene Gas Machine Company, Indianapolis, Ind., has accepted a bonus of \$17,000 and will remove its plant to Homer, Ill.

The Noblesville Water & Light Company, Noblesville, Ind., has been sold for \$55,000 to L. N. Joseph and associates. A. D. Booth is president and James Thom secretary of the company.

The Miller Shoe Company of Cincinnati has purchased a building in Muncie, Ind., in which it will install a branch factory.

The Wayne Oil Tank Company, Ft. Wayne, Ind., which recently increased its capital stock from \$50,000 to \$100,000, has purchased a 4-acre site on which it will erect two factory buildings. Henry C. Berghoff is president of the company.

The court has dissolved the injunction against the city of Peru, Ind., asked by a gas engine company to prevent the city from making improvements to its water works plant before paying amounts alleged to be due on engines now in it.

S. F. Bowser & Co., Ft. Wayne, large manufacturers of oil tanks and measuring apparatus, has decided to issue \$800,000 of preferred stock.

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The Ft. Wayne Automobile Mfg. Company has been incorporated at Ft. Wayne, Ind., with \$20,000 capital stock, to manufacture automobiles. The directors are George P. Dudenhoefer, George T. Fox, H. E. Boeker, Wm. H. Rohan, C. J. Romany, L. J. Willrath and A. C. Harger.

The Chapin Mfg. Company, Indianapolis, Ind., has been incorporated with \$20,000 capital stock to manufacture carburetors and automobile parts. The directors are George F. Quick, William S. Polling, D. Rosenbaum, William Y. Chapin and Frank A. Chapin.

The Town Trustees of Normal City, a suburb of Muncie, Ind., have decided to install a gravity water works system.

The Midland steel works of the American Sheet Steel Company, at Muncie, Ind., after a month's shutdown, accompanied with rumors of removal of the plant to Gary, has resumed operations with 500 employees. Joseph T. Dougherty has been appointed manager to succeed Mark M. McDonough, who died a few weeks ago in Carnegie, Pa.

Stock has been subscribed for by citizens of Hope, Ind., in the Bell Smokeless Powder Company of St. Paul, Ind., and the plant will be removed to Hope and will be enlarged.

The Redkey Electric Light Company has been organized at Redkey, Ind., to supply light and power. The stockholders are R. E. Breed, H. L. Finley, F. B. Ball and others of Muncie, Ind.

The Sanitary Pottery Company, Evansville, Ind., is planning the erection of an addition to its plant to cost \$200,000.

The Terre Haute Post Company, Terre Haute, Ind., has increased its capital stock from \$20,000 to \$40,000. W. C. Mayborn is president of the company.

The Mais Motor Truck Company, manufacturer of motor vehicles, has been incorporated at Indianapolis, Ind., with \$500,000 capital stock. The directors are A. W. Markham, E. W. Spencer and Charles Fisher. The company's plant at Peru, Ind., will be moved to Indianapolis.

The Showalter Brothers Company, Bloomington, Ind., is completing the building at Bloomington of what is said to be the largest factory in the world making bedroom furniture. It will have 6½ acres of floor space. The buildings have some new features. The construction of the skylights is such that it permits alignment of the glass by taking up any shrinkage. The radiating coils are overhead near the roof and will keep it free from snow and ice. The skylight contains 128,000 sq. ft. of ribbed glass.

W. H. Isgrigg & Son, Greensburg, have secured the contract for the erection of a one-story brick addition to the plant of the Bromwell Wire Works of that city. The building will be 60 x 200 ft. and will be used for manufacturing purposes.

Fire destroyed the plant of the Anderson Knife & Bar Company, Anderson, Ind., August 6. Loss estimated at \$30,000; insurance, \$20,000. W. R. Carr is manager.

The Rumely Mfg. Company, maker of agricultural machinery, Laporte, Ind., has let the contract to E. E. Burner & Co., South Bend, Ind., for a new pattern building to cost \$20,000. It will be 60 x 160 ft., of steel and reinforced concrete.

In the additions to the plant of the Portsmouth Machine & Casting Company, Portsmouth, Ohio, are an electric traveling crane, a new compressed air system and cupola. The foundry has just been remodeled and is now able to handle almost any size of gray iron castings.

New England

BOSTON, MASS., August 9, 1910.

A better feeling pervades trade in New England, based not upon changes in actual conditions but upon a more intelligent understanding of the business situation. Production, taking all lines of trade as a whole, has not increased. On the contrary, it has probably fallen off. The textile industry is dull, though improving slightly, and the textile machinery builders are not as busy as they have been during the last 12 months. There are other instances where conditions, seasonable and otherwise, have resulted in a certain amount of curtailment, but probably this is no more than normal for midsummer.

Men who come in daily contact with the manufacturers are convinced that the basis of business in New England is a very substantial one, more so than in 1906-07. Average resources are greater in their ratio to producing capacity. These observers, who include most successful and experienced salesmen, assert that in practically every case where a manufacturer has expressed doubt regarding the outlook his own works are busy. In a large proportion of instances in the metal lines the factories are running at full capacity. To put it plainly, men are worrying over what others may not be doing. They are not making their estimates of the

general situation upon the figures on their own order books or on the inquiries which they are receiving.

The cancellations of orders for machine tools received from automobile manufacturers are not assuming serious proportions. They are confined to some of the very large works. It is doubtful if any New England manufacturer of motor cars or automobile accessories or parts has canceled any of his own orders. The total of parts and accessories the manufacture of which has been held up at the request of the automobile people is large, but these cases also are confined to a comparatively few buyers. While there are exceptions to the rule, the automobile companies who are compelled to go slowly at this time appear to be those who have been increasing their facilities with tremendous strides. Their orders have been on a very lavish scale. Their buying has not been carefully considered and has lacked balance. It is not difficult to appreciate the feverish rush to meet a market which was believed to be far beyond the country's producing capacity. The growth has been so rapid as to disturb organization in some of the great works, which may account for what has been deemed unscientific selection of machinery in its relation to the equipment of which it was intended to be a part. Cancellations are confined almost entirely to those classes of machinery which are practically out of the market. As was stated last week, buyers of machinery in general will be glad of a movement which will place deliveries on somewhere near an easy basis.

The hardware manufacturers are doing a very good business, to quote again the men who are visiting the offices of such concerns. Each reports a satisfactory condition of its own order books. Demand for builders' hardware is not so brisk as it was, and some other rather slight changes are reported. Trade is normal in the Naugatuck Valley. The manufacturers of goods from brass are enjoying an active demand, and the brass mills themselves are said to be booking a satisfactory volume of business.

The strike of the Boston machinists is practically a dead letter. The manufacturers have won their fight for an open shop and most of the works affected by the strike are now running with practically a full force of men. In two instances manufacturers have procured injunctions against the strikers restraining them from interfering with workmen. As the situation looks to-day the strike may continue technically, but its effects will soon cease to be felt even in a slight degree.

The Wonder Worker Shoe Machinery Company, of which Thomas G. Plant, Jamaica Plain, Mass., is the controlling factor, has purchased the large works at Lawrence, Mass., of the Stanley Company, manufacturer of combustion engines and machine parts. The plant is a large one, capable of housing a force of more than 600 men. It was formerly occupied by the Gordon-McKay Company and absorbed in the United Shoe Machinery Company, Beverly, Mass. The shops contain a machine equipment suitable for the needs of the new owner, and this is being supplemented by some new tools. Since the purchase, however, the Wonder Worker Company, or interests closely allied with it, have had out a very long list of machinery, but orders have not been placed, nor is it expected that they will be for the present. Some further development of the situation is looked for before these larger wants will be cared for. The Plant people have been constant buyers of high grade tools for several years, and the routine purchases are expected to continue.

The Rockwood Sprinkler Company, Worcester, Mass., has purchased the property recently occupied by the James H. Whittle Company in that city and will remove its business to the much larger quarters from 2 Arch street. The company manufactures automatic sprinkler systems. The Whittle plant consists of 34,000 sq. ft. of land, on which are a three-story brick shop building, 56 x 233 ft.; a one-story shop, 22 x 30 ft.; a foundry, 60 x 80 ft.; pattern shop, 18 x 190 ft.; blacksmith shop, power plant and office building. A large amount of new machinery will be installed, the works renovated throughout, and a spur track put in.

The Merrifield Building Trust, Worcester, Mass., will erect an additional building for rental for manufacturing purposes, 50 x 60 ft., four stories.

The Mianus Motor Company, Stamford, Conn., manufacturer of gasoline engines, will build a one-story addition, 60 x 150 ft. The company has recently purchased a tract of land containing 5½ acres, which will permit of future expansion.

Estimates are being received on new plans for the Mason Laboratory of Mechanical Engineering, which will be built at New Haven, Conn., for Yale University.

A hydro-electric plant will be established at Franklin, N. H., the power from which will be carried on high tension lines to Concord, N. H., for the shops and yards of the Boston & Maine Railroad. Stone & Webster, Boston, are the contractors.

Work will begin immediately on the new power plant of the Worcester Electric Light Company, Worcester, Mass.,

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which will be 80 x 148 ft., two stories. The Westinghouse, Church, Kerr Company, New York, are the engineers.

The Liberty Cartridge Company, Mt. Carmel, Conn., is engaged in building special machinery for the manufacture of its product, and does not expect to begin production for the market before the first of next year.

The New Departure Mfg. Company, Bristol, Conn., is installing a 500 hp. Snow gas engine, two double end mufflers, two carbonizing furnaces and an annealing furnace. The ball bearing and coaster brake departments are running night and day.

Additions to general manufacturing industry include the following: Stevens Linen Works, Dudley, Mass., tentative plans for enlargements to increase capacity 50 per cent.; East Brook Company, Gardner, Mass., mill to manufacture a cotton substitute; Eastern Chemical Works, Hartford, Conn., plant at 32 Morgan street, to manufacture photographic chemicals; Slater Cotton Company, Pawtucket, R. I., additions to cost \$30,000.

J. M. Brady, 847 Main street, Hartford, Conn., is organizing a corporation to be known as the Rex Motor Company of America, which will control the manufacture of a new gasoline engine, the invention of Prof. J. J. Hogan of Yale University. The company will maintain control of the patents and will organize local companies in various sections of the country for the manufacture of the engines. A Hartford company will establish works under the patents, and others are projected for the immediate future. The motor is spoken of in high terms by those familiar with it. It is designed primarily for use in automobiles and aeroplanes.

The reorganization of the Oakley Steel Foundry Company, Millbury, Mass., has been completed and the name of the corporation changed to the Millbury Steel Foundry Company. F. W. Moore, Millbury, is the president; Henry T. Maxwell, Millbury, treasurer and general manager, and W. B. Nourse, Worcester, superintendent. The directors are Messrs. Moore and Maxwell and William A. Pentacost, H. H. Merriam and William L. Neilson, Worcester. The company makes a specialty of crucible steel castings.

Cleveland

CLEVELAND, OHIO, August 9, 1910.

While the local machinery market is quiet, the volume of business that is coming out is about normal for this time of the year. Business with the machine tool dealers during some of the machine tool manufacturers report an improvement the week was confined mostly to single tool orders. Several good inquiries that have come out during the past month are still pending. These purchases have not been held up. The machinery in most cases is needed for plant additions and is not needed immediately. The demand for second-hand machinery continues good. While cancellation and the holding up of orders by some of the automobile trade, mostly by makers of low priced cars, has had an unfavorable effect, a falling off in the demand from this source had been anticipated by machine tool builders and dealers for some time. They felt that the rapid growth that industry had experienced during the past two years or more must soon reach a limit and for some time they had been looking for a falling off in the demand from this source for new machinery equipment. In lines not associated with the automobile trade a fair amount of business is coming out, and went over July during the first week of August. The trade generally takes an optimistic view of the situation and is looking for a good volume of business in the fall. Very little business has come from the railroads for the past year or more and the feeling prevails that some of the roads will be unable to delay purchases of needed equipment much longer.

The general manufacturing situation outside of plants making automobile parts continues satisfactory, new orders being fairly plentiful. Excepting those plants that make automobile castings, business in the foundry trade is holding up well.

The Damascus Brake Beam Company, maker of brake beams for railroad cars, has purchased the plant in Cleveland formerly owned by the Cowing Engineering Company, which has been idle since the latter company failed about two years ago. The Damascus Company, whose headquarters are in this city, has been operating a plant in Sharon, Pa., which was badly damaged by fire a few weeks ago. It has not yet been decided whether the Sharon plant will be abandoned. The Cowing plant is practically a new one, having been built as a structural steel fabrication shop. The plant includes one building 100 x 450 ft. and several smaller structures. It is located on a 11-acre site on the Nickel Plate Railroad. The plant was sold for about \$150,000. The Damascus Company expects to fit it up for

its purposes very shortly, and considerable new machinery will be installed. This plant will give the company a large increase over the capacity of its Sharon plant.

The National Acme Mfg. Company, Cleveland, maker of automatic screw machines and screw machine products, has commenced the erection of a four-story addition to its plant, of brick construction, 40 x 185 ft. This will be used for a stockroom, case hardening department and other purposes. The extension will provide the company with more room in its manufacturing departments, where the machinery has become somewhat crowded. The company is running its plant at full capacity and reports that new orders are up to normal for this time of the year.

The Crucible Steel Castings Company, which established a plant at 800 Canal road, Cleveland, several months ago, has taken out incorporation papers with a capital stock of \$25,000. The company is planning a number of improvements to its plant and will install a machine shop, the equipment for which it will probably be in the market for shortly. Officers have been elected as follows: William Schmehl, president; Charles Kaufman, vice-president; A. H. Kaufman, secretary and treasurer; H. L. Aiken, general manager. The company reports a very satisfactory volume of orders and a steady growth in its business.

The Marion Shovel & Dredge Company, Marion, Ohio, has been incorporated with a capital stock of \$400,000 for the manufacture of steam shovels, dredges and similar equipment. An option on a 125-acre tract lying between the Hocking Valley and Pennsylvania railroads has been secured for a site. It is expected that sufficient stock subscriptions will be secured to start the erection of the plant in a short time. The incorporators are John D. Owens, Arthur E. Cheney, David W. Evans, Clifford A. Owens, Harry J. Barnhart, George D. Copeland and George B. Christian, Jr.

The W. H. Mullins Company, Salem, Ohio, maker of various sheet metal products, reports that the volume of its orders is holding up in a very satisfactory manner. The company's entire plant is well filled with work, with some departments running double turn and others overtime.

The Kanneberg Roofing & Ceiling Company, Canton, Ohio, has acquired a site adjoining its plant and expects shortly to enlarge its present capacity by the erection of an extension to its main building, 200 ft. long by about 60 ft. wide. Additional stamping presses will be installed.

The Carey Company, Cleveland, has been incorporated with a capital stock of \$150,000. This company is to be operated as a selling organization in connection with the Carey-Phillip Mfg. Company, manufacturer of magnesia and asbestos pipe and boiler covering and roofing, located on West Ninth street.

The Canton Electric Company, Canton, Ohio, is building a new boiler house and will install three 500-hp. boilers with automatic stokers and an electric crane. The Canton Boiler & Engineering Company is erecting a 250-ft. smokestack for the new plant.

The Willis-Overland Company, Toledo, Ohio, maker of automobiles, has increased its capital stock from \$2,000,000 to \$6,000,000.

Sealed proposals will be received by the Board of Trustees of the Athens State Hospital, Athens, Ohio, August 25, 1910, for the erection of a standpipe, two 150-hp. horizontal tubular boilers and a system of steam and water piping to be installed at the State Hospital in Athens.

Detroit

DETROIT, MICH., August 9, 1910.

While there has recently been some complaint here that trade had fallen flat, any statement to that effect is disputed by the activity of various local machinery houses, including manufacturers, who feel well satisfied with the record made during July, right up to the close of the month. For the first few days in August there appeared to be a pronounced lull in buying, but this can be largely ascribed to the fact that consideration of inventories and financial statements was very general just then on the part of officials of many large companies, with consequent delay in making new contracts for either equipment or material. The present week is opening comparatively strong. Not only has there been an influx of inquiries and orders here, but machinery builders out in the State and to the southward in Ohio and Indiana write very cheerfully to local representatives and others concerning the situation. The unparalleled amount of construction work now under way all through this territory is forcing purchases of tools, power apparatus, &c., where they have not already been made, and numerous lists are still awaiting approval or known to be in preparation.

Aside from the between season shutdown of automobile plants, the leading manufacturing establishments are run-

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ning practically to capacity, except where scarcity of skilled labor renders it impracticable to do so, and the output for the current month will be about the same as in July, which was uncommonly heavy for midsummer. At all of the brass and aluminum foundries new men are being taken on as obtainable. From the automobile companies the demand for fall deliveries from these foundries is heavy, their policy, as announced by an official of the Packard Motor Car Company, speaking in behalf of his own company, being to keep their output this autumn up to the top notch. As far as possible, however, they will make use of machinery already installed, the rush to provide additional facilities having abated somewhat. This is due partly to delays in construction plans and to difficulty in getting men to operate additional machines. It has also been ascribed in some quarters to a disposition on the part of the motor car builders to slow down a bit with respect to enlargements, and there has been talk of cancellation of orders for tools, but the latter will probably be found to take the form mainly of substitutions of certain lists for others, due to alterations in plans, which have not yet been fully decided upon. There is not likely to be any serious retrogression from the scheme of expansion mapped out by the leading interests.

The Anderson Carriage Company, Detroit, is having work started on a three-story factory building, 80 x 300 ft. Most of the machinery required has been already provided for.

The present active interest of electric traction lines in all improved appliances has created an excellent demand for the products of the Hensley Trolley & Mfg. Company, Detroit. It is making a specialty of a trolley wheel of very simple construction which is lubricated by the use of a spindle and hollow hub, graphite bushings being done away with.

Interests identified with the Hercules Hoop Company, Durand, Mich., are reported to contemplate the erection of a factory in Cadillac, Mich.

The Ohio Brass Company, Mansfield, Ohio, offers for use in the bearings of engines, generators, motors, &c., a metal which is stated to be made after Isaac Babbitt's original formula.

The M. Lamont Company, Bay City, Mich., is planning the construction of a large woodworking plant, including planing mill and box factory. The details of equipment and date of erection have not yet, however, been fully decided upon.

A hoisting plant built in the shops of the Wellman-Seaver-Morgan Company, Cleveland, has been installed by Pickands, Mather & Co. of that city, at the Hemlock Mine, Amasa, Mich., where a new shaft house was recently completed.

It is anticipated by dealers here that equipment will be needed shortly for an addition to the plant of the Huntingburg Wagon Works, Huntingburg, Ind. Contracts for the construction work have already been let. The plans are said to include electric drive.

It is reported that W. A. Story, manager here for the Erie City Iron Works, Erie, Pa., has been elected vice-president of the S. B. Martin Company, recently incorporated for \$225,000, which will operate a stone quarry at Fiborn, Mich., on the upper peninsula.

The Springfield Metallic Casket Company, Springfield, Ohio, is putting on more hands for brass work.

A report just made by the Buick Motor Company, Flint, Mich., shows that during the second quarter of this year 8697 cars were built in its shops. In view of the present statements concerning overproduction of automobiles, it is interesting to note that on July 27 the company had a total of 3461 machines on hand, nearly one-third of which were unfinished. This number also included delivery trucks.

Contracts for the erection of a manufacturing plant, 60 x 130 ft., four stories, are about to be let by the Detroit Show Case Company of this city. All of the mechanical equipment needed will be electrically operated and controlled.

The Huebner Mfg. Company, Detroit, is reported to contemplate some enlargement of its woodworking plant. With the existing facilities, however, more skilled men could be employed than are at present available.

Purchases have recently been made here of equipment for the new factory of the Taylor-May Machine Company, Rochester, N. Y., which will be largely devoted to the manufacture of automobile parts and accessories. Some further apparatus will be required as the plant nears completion. It is understood that induction motors for alternating current will be used for operating the machinery on power supplied by the Rochester Railway & Light Company.

Wickes Bros., Saginaw, Mich., have sent out their monthly stock list of second-hand machinery, which includes machine tools and general machinery, engines, boilers, pumps, dynamos, motors, &c. The classification is in very convenient form for reference.

Machinery is now being provided for the new building to be erected here by the Michigan Pressed Steel Company, De-

troit, the plans for which were recently mentioned in *The Iron Age*. The shop, which will be 60 x 200 ft., is one of a number of similar units to be constructed for the various purposes of the business as the need develops.

At a recent meeting here of automobile engineers, it was decided to recommend a material reduction in the number of standard parts for which stock ordinarily has to be carried.

F. G. Hood, Pentoga, Mich., recently organized the Lignum Chemical Company, which will erect a manufacturing plant at Marinette, Wis., for the production of various acids. A site has been secured and plans for the buildings are under way. The apparatus required has not yet been fully decided upon.

The Riverside Machinery Depot, Detroit, is offering to the trade a very full list of used and rebuilt machinery for iron, brass and woodworking, power equipment, &c. Considering the time of year, trade at present is quite satisfactory.

Eastern shipyards are making a vigorous campaign here for the employment of skilled shop operatives, riveters, &c., for work on steel vessels and their machinery.

In an interview recently granted by one of the officials of the Packard Motor Car Company the fact was brought out that the output of the company was increased from 200 cars in 1904 to 3270 in the present year. The number of employees engaged in manufacturing is 7211. A new building to increase the output of the motor-truck department has been started, and plans calling for the gradual erection of a number of other shops have already been determined upon.

The Union Clay Mfg. Company, Empire, Ohio, is preparing to install some power equipment, the principal details of which have already been contracted for.

A machine shop to take care of the repairs on automobiles owned by the city is being erected on Belle Isle at a cost of approximately \$20,000.

Manufacturers of this vicinity who make a specialty of tools and other equipment for motor car plants expect to figure on apparatus for a factory which it is said will be erected at some point in Missouri by the Banner Automobile Company, composed of interests largely identical with those of the Banner Buggy Company, St. Louis, Mo.

It is reported from Saginaw, Mich., although without direct confirmation, that the Lufkin Rule Company of that place has decided upon a large increase in its output for the coming year, made necessary by the growth of trade, with consequent extension of its factory.

A number of firms here who expected to supply some of the equipment for the Jewell Steel & Malleable Company's new works at Buffalo, N. Y., appear to have been forestalled by early purchases, but it is likely that some additional machinery and tools will be required before the plant is operated to its capacity.

The Pontiac Foundry Company, at Pontiac, Mich., will commence construction at once on a brick factory building, 170 x 270 ft., with an L addition, 32 x 60 ft. The company proposes to conduct a general jobbing foundry and will make castings of all kinds to order.

The Jackson & Church Company, 300 Cleveland street, Saginaw, Mich., expects to purchase two traveling cranes, rolls and some boiler shop equipment, which is to be installed in a new plant the company will shortly construct.

John B. Corliss, Jr., 34 Canfield avenue, Detroit, Mich., has had plans prepared for a machine shop, 100 x 100 ft., by George D. Mason, 80 Griswold street, who is now letting contracts.

Milwaukee

MILWAUKEE, WIS., August 8, 1910.

Trade thus far this month has been very much better than for the similar period in July, and with few exceptions manufacturers seem to be satisfied. No contracts of any considerable size are reported, but there is a steady run of the orders upon which most dependence is placed and the shops are kept operating practically to capacity. A good deal of repair work has been coming in lately, and some plants have also taken advantage of the summer quiet to accumulate stocks of parts which are furnished on annual contracts. The foundries are not as much rushed as they were, but have enough business booked to carry them well into the fall.

One line of production which shows great activity is that of compressors and air brakes for electric traction and street railroad service. Milwaukee is now the leading center for the manufacture of such equipments, and contracts have been closed with companies in many of the principal cities to keep them continuously supplied for long periods of time with everything of the kind that is needed for operating their systems.

The subject of gas power continues to occupy the attention of some of the larger machinery builders, and it is

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anticipated, with good reason, that the production of machinery for the purpose will increase at least 50 per cent. during the next 12 months. Some very powerful and economical gasoline motors are also being developed. A notable example of this is to be found in the locomotive for mining, industrial railroads and contractors' service being built by the Milwaukee Locomotive Mfg. Company, which utilizes gasoline as its driving power. The machine has proven very efficient and is attracting a great deal of attention. Other Wisconsin concerns are experimenting with something similar or have already put a machine on the market, as in the case of the Termaat & Monahan Company, Oskosh, whose apparatus is, however, designed for lighter service.

Boiler and tank building has been revived to a degree which not long ago was thought impracticable, in view of the hold which these industries have obtained in other parts of the country. Probably a majority of the apparatus for high pressure service sold in this State for some months past has represented Wisconsin labor, and the principal shops in which it is built have apparently all they can do to keep up with orders. A leading manufacturer of engines and other power machinery is also preparing to put on the market a new type of boiler which is said to equal any of the most advanced design, but the formal announcement of that fact is withheld for the present.

The Cutler-Hammer Mfg. Company of this city has met with a degree of success in the introduction of its improved type of lifting magnet which is beyond the expectations originally entertained. It is now being used not only for unloading and handling material at foundries, steel mills, &c., but also for a great variety of service that experience has developed. Figures are in the possession of the manufacturer which show the actual economies effected, so that the salesmen who go out in answer to inquiries can deal in concrete facts rather than theory or argument. The future of this industry is very bright.

The McDonough Mfg. Company, Eau Claire, Wis., has found this one of the best seasons in its history, taking the first seven months of the year as a whole. A feature of its trade which has been very successful is the sale of the heavy resawing machinery, which it was a pioneer in developing. It is now certain that during the coming fall the demand for this will be very strong.

The C. Colnik Mfg. Company, Milwaukee, has the contract for a steel frame addition to be made to the plant of the Lytle-Stoppenbach Company, Jefferson Junction, Wis.

Electric power will be used in new buildings, 30 x 40 and 20 x 96 ft., to be erected by the Milwaukee Elevator Company, Milwaukee, at Walworth, Wis.

The Valley Iron Works Company, Appleton, Wis., has kept its foundry and machine shops principally occupied this season with work for the pulp and paper mills, of which it makes a specialty. The woodworking shop connected with the plant has also been busy on tanks for this trade, which have to be made of acid resisting material.

The new factory to be built by the Chippawa Falls Chair Company, Chippawa Falls, Wis., will be three stories, 80 x 100 ft. Electric power is to be used, but whether it will be generated on the premises or purchased from the local central station has not yet been decided.

The Termaat & Monahan Company, Oshkosh, Wis., notes an increasing interest in small gasoline and oil locomotives, of which it manufactures a very compact, serviceable type.

It is reported from Chippawa Falls, Wis., that the gasoline engine factory of P. J. Holm & Sons will be enlarged and steps taken to make this one of the leading industries in that part of the State.

An electric motor of about 500 hp. and other equipment for driving a wood pulp grinder is required in connection with the Forest Products Laboratory at the University of Wisconsin. Bids are to be taken until August 12.

The La Crosse Steel & Bridge Company, La Crosse, Wis., has been awarded the contract for constructing a steel bridge at Union Mills, Wis.

The Northwestern Steel & Iron Works, Eau Claire, Wis., is commencing work on the foundations of the new foundry, 100 x 200 ft., and also has a pattern storage building in process of construction.

The Commercial Club at Onalaska, Wis., has a committee on new industries, which is out after factories for that place, and it is stated that announcement of the location of a plant there will be made shortly.

The Superior Iron Works Company, Superior, Wis., has in operation at various plants a new type of shaking and dump grate for power plant furnaces which possesses some unique features, its principal advantage being in the large air surface arising from the construction used.

It is reported from Wabeno, Wis., that A. E. Ruche & Co. of that place will erect a factory for the production of woodenware. It will be operated by water power.

The municipal light and water plant at Evansville, Wis., which is equipped with two engine driven generators of 150

kw. for alternating current, furnished by the Westinghouse Electric & Mfg. Company, will have its capacity increased by machinery now being installed. Beginning this fall a commercial day load is to be carried, and further extensions may be looked for.

The Standard Oil Company has acquired a site at Green Bay, Wis., on which to erect a boiler house, warehouse and storage tanks for a capacity of 4,000,000 gal. Brick, steel and concrete construction will be used.

The Power & Mining Machinery Company, Milwaukee, is preparing to introduce more extensively its gas producer system, which has been put in very successful operation at some of the leading gas power plants of the country. A station in this vicinity, where the producers are installed, is that of the Milwaukee Northern Railway, at Port Washington, Wis. Tests made of the plant have been very favorable and it has made an excellent showing in regular service, supplying two gas engines of 1500 hp. each.

The Ashland Light, Power & Street Railway Company, Ashland, Wis., has been granted a permit to establish a substation at Ironwood, Mich., and it is reported that with the increased service now contracted for it will build another hydroelectric plant at Copper Falls.

The Northern Reduction Company, Milwaukee, has been incorporated for \$50,000 by H. C. Carr, F. C. Gross and C. P. Hobson to establish a fertilizer factory.

The Jacob J. Vollrath Mfg. Company, Sheboygan, Wis., has filed with the Secretary of State at Madison, Wis., an amendment to its charter increasing the capital stock to \$500,000 and the number of its directors from three to five.

The Rock River Machine Company, Janesville, Wis., is erecting a machine shop, 90 x 108 ft., which will have three aisles 30 ft. wide with a 15-ton crane running through the center aisle. A vacuum heating system will be installed for which the contract has been placed. The company is not in the market for any new machine tools or equipment at the present time, but probably will purchase a little later several lathes, grinders, boring mill, key seater and shaper. The lathes to be installed will be of 18, 32 and 34 in., and the boring mill about 54-in. swing. The installation of tool room grinder for reamers, &c., is also being considered.

The Koehring Machine Company, Milwaukee, Wis., has increased its capital stock from \$50,000 to \$100,000, but advises it is not contemplating any additional improvements or the purchase of any new machine tools or equipment.

The Wausau Sulphate Fibre Company, Wausau, Wis., has under construction a new plant which will consist of three buildings, the largest of which will be 70 x 525 ft., two stories. The plant will be operated by electricity, a large dam supplying the water power.

Sealed bids for installing an electric light plant for the village of Browntown, Wis., will be received by the village clerk until August 17. Bids will be received as follows: For furnishing and installing a 25-hp. gasoline engine, belt connected to an 18-kw. generator, and furnishing and erecting a pole line.

St. Louis

ST. LOUIS, Mo., August 8, 1910.

A feature with some of the leading merchant metal working machinery houses is numerous inquiries, the head of one of them stating that not in 30 years has the number been so great in the summer. The percentage of which is resulting in business is not so large as might reasonably be expected. A canvass covering quite a number of local, together with representatives of outside companies, with but few exceptions shows manufacturers of iron and steel and allied products seasonably active, with good prospects for an increased demand in the fall.

The Koken Iron Works has a good run of business. Among its recent contracts are the following: Steel work for a public schoolhouse at Denver, Colo.; a bridge for the War Department at Cache Creek, near Fort Sill, Okla.; a highway county span, Lemhi County, Idaho; steel work for United States Post Office, Lander, Wyo.; frames and waste gates, Marble Falls, Texas; head frames, Pachuca, Mexico; science building, University of Colorado, Boulder, Colo., and has just completed a steel job for Japan.

Early in the year the Brown Machinery Company removed to 515-517 Main street. The quarters it now occupies are so spacious that its stock can be displayed to best advantage. It states that there is this summer a very good demand for engines, boilers, saw mill and woodworking machinery.

The W. C. Johnson & Sons Machinery Company reports being in receipt of a remarkable number of inquiries, mostly for heavy machinery; also for boilers, engines and pumps; but only a fair percentage result in business. Mr. Johnson states that the company is to-day shipping two cars of engines and boilers to a customer in Oklahoma.

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J. W. Wright & Co. finds a normal demand for this season of the year prevails. For the most part the call is for the heaviest tools. Second-hand machinery is not wanted to much extent. There is some demand for electrically driven tools. For automobile stuff it is more quiet than in the spring.

The W. R. Colcord Machinery Company states that the company finds the best demand is for light machine tools. The Rogers Automobile Company has an order in for tools. In the main there is good inquiry, coming principally from outside St. Louis.

The Broderick & Bascom Rope Company, C. E. Bascom says, is fairly well satisfied with conditions in its line, since there is a steady demand for its specialty, Yellow Strand wire rope. This is in use by the Government at Panama, which order was filled with the size taking a breaking strain of 100 tons. The logging, quarrying and mining interests are being heard from right along.

The A. Leschen & Sons Rope Company is running night and day shifts at its wire rope plant. This does not indicate an unusual demand, as it is merely its normal position, this having been its custom for some years past and was only temporarily cut down to a day shift for a while following the depression of the early part of 1908.

The N. O. Nelson Mfg. Company is enjoying a good business not only from its branch houses in the West and on the Pacific Coast, but also from Texas. Its local trade is good and many orders are coming from Kansas City. Business for the first half of 1909 exceeded that of the same period in 1908. Its shops at Leclair, Ill., are running on full time.

The St. Louis Rail & Equipment Company states there has been considerable call for rails, weights 56, 60 and 70 lb. There is a fair demand for light equipment from steam and electric roads; rather the best from the latter interest. It has recently had calls for narrow gauge engines from Cuba and Mexico. The railroads seem to have cleaned up their engines, and second-hand stock is pretty much in the hands of dealers. Relaying rails are in small supply.

The Wesca Supply Company finds a fair demand for electrical supplies and electrical machinery, though this is the quiet season in its line. Inquiries for future wants are coming in quite freely. New electric railway lines are being projected and the outlook for fall business is good.

The Wagner Electric Mfg. Company has secured the contract for two 200-kw., 23, 100-volt, 25-cycle transformers for use in connection with the Salt River irrigation project, Arizona, at a price not to exceed \$1515 each.

Geo. B. Ogan, Western manager for the Hess Spring & Axle Company, reports that the Banner Buggy Company has placed with his company an order for vehicle axles, the specifications for which call for 25,000 sets, and 30 freight cars will be required to transport them.

The Lindell Motor & Auto Parts Mfg. Company has been incorporated. Capital stock, one-half paid, \$6000. Incorporators: Edward B. Campbell, Alfred A. Wagner and George S. Brunks. To manufacture and deal in motor vehicles and accessories.

The H. G. Turley Machine Company reports business good for its specialty of cut machine gears of all kinds. The business was recently incorporated with a capital stock of \$25,000.

The Standard Adding Machine Company regards the demand for its machines as satisfactory for this season of the year.

The Champion Shoe Machinery Company, maker of shoe sewing and polishing machines for the use of shoe repairers, states it is doing well for the season.

The Cotton Belt Railroad has its new shops at Tyler, Texas, under way, and the machinery is beginning to arrive. The entire equipment, including cranes, was furnished by one of the Eastern houses, the order having been placed some time ago.

The Monarch Metal Weather Strip Company, maker of rubberless weather strips, is having an active demand for its specialty.

The Hannibal Tool Company, a new concern just starting in Hannibal, Mo., is in the market for an equipment of lathes, milling machines, drop hammers, &c.

The Harrisonville Foundry & Machine Company of Harrisonville, Mo., recently purchased an equipment for its plant, of St. Louis houses.

The Medart Patent Pulley Company finds business thoroughly satisfactory for midsummer on its line of pulleys, shafting and transmission machinery.

The Whitman Agricultural Company, maker of high grade hay presses, reports a satisfactory seasonable demand. This company has just completed a three-story warehouse addition.

The F. E. Schonberg Mfg. Company, manufacturer of window and door screens, has well under way a new three-story addition to its plant.

The Miller Elevator Company is quite busy on orders for freight and passenger elevators.

St. Louis Iron Machine Works has been well occupied on Corliss engine work and also has several orders in hand for ice plant equipment.

The Woodstock Safety Chuck Company, Woodstock, Ill., certifies to an increase in capital stock from \$20,000 to \$25,000.

The Springfield Traction Company, Springfield, Mo., has purchased additional ground for the enlargement of its car barns and machine shops, for which definite plans have not been decided upon.

The Citizens' Electric Light & Power Company, the Southwestern Light & Power Company and the East St. Louis Light & Power Company, all of East St. Louis, Ill., have been consolidated under the title of the last mentioned company with a capital stock of \$1,000,000. The officers of the consolidated company are: J. C. Haynes, president; H. D. Sexton, first vice-president; M. S. Hipkins, second vice-president; G. L. Estabrook, secretary and treasurer; T. L. Gregory, assistant secretary and treasurer.

The National Clock & Electric Mfg. Company, St. Louis, Mo., is considering the erection of a new factory. Plans for the building have not been prepared, as the company has not yet secured a site, although it has several under consideration.

The Kansas City Pressed Metal Radiator Company, Kansas City, Mo., recently organized with a capital stock of \$75,000, is negotiating with several cities for a suitable location for the erection of a factory. Machinery to be installed in the factory has all been contracted for and is now under construction. The officers of the company are: James Muir, president; Thomas H. Walker, vice-president and general manager; W. Z. Flanery, secretary; Paul F. Covington, treasurer.

The South

BIRMINGHAM, ALA., August 8, 1910.

Considerable interest has recently been aroused in the possibilities of the Ensley district, near Birmingham, as the center for a grouping of related industries similar to that now in progress at Gary, Ind. Several large manufacturing companies dependent on the steel mills and coke ovens for their raw material, fuel, &c., are known to have been investigating conditions in that vicinity, and some important developments of interest to machinery supply houses may be looked for shortly. One of the things which is said to have had most consideration is the matter of securing and retaining skilled labor. In this housing conditions, local transportation, public utilities, &c., are controlling factors; consequently the unfolding of plans for the new industrial city of Corey will have more than a little influence on the situation.

It has been decided at Opelika, Ala., to proceed with the construction of an electric plant to be used in municipal service, and funds for that purpose to the amount of \$85,000 are now being provided.

Two steel and brick warehouses, 122 x 148 and 125 x 157 ft., will be added to the plant of the C. C. Mengel & Bro. Company, Louisville, Ky.

The Eastern Tennessee Power Company has been organized at Chattanooga, Tenn., to build a large hydro-electric plant on the Ocoee River and construct an interurban railroad.

The Lubin Mfg. Company, N. D. Lubin, manager, has been organized and will establish a plant at Anniston, Ala.

A new plant has been completed at Anniston, Ala., by the Hale Buggy Company.

The Bering Mfg. Company, Houston, Texas, is making purchases of machinery for a large new timber-cutting plant at Pawnee, La.

If satisfactory arrangements are not made to take over the plant of the Ocala Water Company, Ocala, Fla., the city will build its own power and pumping station, equipped with modern, high duty machinery.

An engineering firm is about to be selected by the city of Charleston, S. C., to prepare plans and specifications for the proposed municipal electric plant to be used in power and lighting service.

It is reported from Columbus, Miss., that the Southern Mfg. Company of that place, which recently opened its plant there, has been chartered to manufacture vehicles as well as agricultural implements and machinery, and that an additional factory for that purpose may be erected. One of the organizers of the new concern already operates a vehicle plant in the North.

Construction was recently commenced of a large stove factory at Colfax, La., for the Colfax Hardwood Lumber Company, which will probably be electrically operated.

A district engineering and sales office has been established in the Woodward Building, Birmingham, Ala., by the

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Wagner Electric Mfg. Company, St. Louis, whose trade through this section is now very large.

Considerable new machinery has just been installed in the plant of the Memphis Saw Mill Company, Memphis, Tenn.

The Richmond Electric Company, Richmond, Va., is putting on the market a variable speed alternating current motor of the induction type, which shows uncommonly high efficiency for a machine of that class.

Some additional pumping machinery will probably be required this year at Morgan, La., where an extension of the water system is being planned.

An elevated steel tank or water tower will be required for erection at Montezuma, Ga., where an appropriation has been made to cover the expense.

B. J. Robinson, Vicksburg, Miss., is having plans drawn by Wm. A. Stanton of that place, whose office is above the First National Bank, for a machine shop, 75 x 100 ft., two stories, to be used for general contract and repair work.

The Vicksburg Traction Company, Vicksburg, Miss., is planning to install a modern coal handling system in connection with its power plant. A machine and forge shop for repair work will also be built.

Contract has been awarded the Johnson Iron Works, Ltd., New Orleans, La., for constructing a steel vessel to be used by the Federal Government in river work.

Sealed bids will be received by the city of Ophelika, Ala., until August 31 for furnishing all material and labor and constructing a water works and electric lighting systems. L. F. Dickson, Mayor.

The Southwest

KANSAS CITY, MO., August 8, 1910.

Sales of both high and low pressure boilers, heaters, pumps, regulators, &c., have been the principal feature of recent trade, with steam, gas, gasoline and oil engines probably next in importance. In the line of equipment for metal working plants there has not been much doing, although some inquiries are out that will develop into orders before a great while. The same is true, but in greater measure, of woodworking shops, planing mills, stave factories, &c., for which considerable machinery will be needed by or before October 1. In the mining districts around Joplin and elsewhere considerable activity is impending, and some purchases of equipment will take place soon after the beginning of fall. A little later the sawmill trade of Arkansas, Texas and Oklahoma will cut quite a figure, and the tendency during the coming season will be to install heavier apparatus than in former years. Quality is also coming to be more considered. In the construction of mill buildings structural steel will be more and more used in future. Recently this was an absolute innovation, but its advantages are coming to be recognized, and anything of this kind which tends toward permanency of plants cannot fail to have a large influence upon the character of their equipment. The systematic development of the country in connection with logging is, moreover, leading to plans for industrial railroads which can be converted into feeders or connections for trunk lines. With these come the establishment of machine shops for repair work, and in pending projects are comprised a number of such plants that will compare favorably with those of Eastern companies. Taking into consideration merely the factors above stated the outlook for future business in the Southwest is excellent, and with its many other resources a favorable market during autumn and winter is practically certain.

An addition is to be made to the car shops of the Springfield Traction Company, Springfield, Mo.

The Smith Automobile Company, Topeka, Kan., is increasing its force of machinists, assemblers, testers, &c., and will operate to its fullest possible capacity between now and spring. Men skilled in this work have to be obtained largely in the East.

The Heaton Wagon Company, which is headed by Walter Heaton, Neosho, Mo., is planning the erection of a factory in which motor drive for machinery will probably be used.

The Craig Machinery & Wood Feather Mfg. Company, Kansas City, has had plans drawn for a new manufacturing plant, the initial unit of which will be 70 x 140 ft. A material used in packing fragile ware will be the product of the plant.

The foundation for the new pumping engines at the Quindaro water works station, Kansas City, has been ordered from the Midland Bridge Company of this city.

New machinery, including a large motor driven pump, is being installed at the shaft of the Jerome Verde Mining Company, Jerome, Ariz. Considerable additional equipment will be required later on, when the property is kept free from water.

A large incineration plant, the waste heat from which

may be used under boilers in a steam power station, will be built for municipal use at Kansas City.

A large building for the assembling and storage of agricultural machinery is about to be erected in Kansas City by the John Deere Company, Moline, Ill.

The construction of a substation, equipped with transformers and a rotary converter of 500 to 600 kw., has been decided upon by the Southwest Missouri Electric Railroad Company, Webb City, Mo. A switchboard and protective apparatus will also be needed.

The Frisco Mines & Power Company, Kingman, Ariz., has purchased two grinding mills from the Harding Conical Mill Company, New York City, for installation at one of its properties.

Machinery will be provided shortly for a new plant which the Creamery Package Company is starting to erect at Blytheville, Ark. It will probably be motor driven.

It is reported from Oklahoma City, Okla., that the Farmers' Motor Wagon & Plow Company has been formed there with a capital of \$100,000, and will erect a manufacturing plant. Further details are lacking.

The city of Provo, Utah, has sold bonds in the sum of \$90,000, the proceeds to be used for the construction of a water works system.

Thomas J. Freeman, receiver and general manager of the International & Great Northern Railway Company, has issued an order for the erection at Taylor, Texas, of three additional buildings which will be used for a power house, sand drying house and bathrooms, closets and lockers. Other improvements under course of construction at Taylor consist of a lake and dam for a water reservoir, coal chutes, water pumping station, tank and turntable.

It is understood that the Hydro Carbon Company, Wichita, Kan., which recently made extensive improvements to its plant, is in the market for a 60-hp. gas engine.

The Tulsa Boiler, Bridge & Mfg. Company has been organized at Tulsa, Okla., to manufacture all kinds of boilers, tanks and bridges and to do general machine work. The plant will be in operation within three months and will employ several hundred men.

The Northwest

MINNEAPOLIS, MINN., August 8, 1910.

Among the more important contracts recently taken by local supply houses are orders for equipment used in quarrying, rock crushing, road making, ballasting and concrete construction. The last named has been a very remunerative source of business for some months past, and it is now reinforced by the other lines mentioned, which have become active in consequence of the great amount of improvement work that will be carried on during the remainder of the open season. Not only are the railroads and traction companies putting vast quantities of ballast into their roadbeds, but the bonds voted by counties and municipalities at the late spring and early summer elections are now available for highway betterments, concrete bridges, culverts, revetments, dams, &c., and contractors in these several lines are crowded with work. This spurt of buying will, however, not last very much longer. Users of such machinery have demanded and been accorded almost immediate delivery, as the condition which has lately existed was foreseen by manufacturers and very well provided for.

Pumps continue to find a good market in all sections of the Northwest. Gasoline engines are largely wanted; mixers sell readily; hoists have been in fair demand, but will not be much longer; excavators required for this season have mostly been supplied; electrical machinery is still called for with great regularity; steam generating equipment can be placed at many points, and for the ordinary run of equipment of all kinds conditions are fairly good for August. July business was surprisingly good in the aggregate, as there has not been much surface indication of the amount of trade actually in progress, and the showing made this month ought to be better.

The South St. Paul Light, Heat & Power Company, South St. Paul, Minn., which is operating two Fort Wayne generators of 175 kw., alternating current, driven by Murray Corliss engines, has under consideration improvements in its electric system.

It is reported from Reach, N. D., that a machine shop, 100 x 100 ft., equipped partly for automobile work, will be erected there by A. E. Kastien.

New boilers may be added to the municipal light and water plant at Hibbing, Minn., for the purpose of establishing a central heating system.

The Diamond Iron Works, Minneapolis, furnished six 16 x 70 high pressure boilers for the plant that is now being put in operation at Jone, Idaho, by the Panhandle Lumber Company, Spirit Lake, Idaho, which is regarded as the most modern of its kind in the country.

THE MACHINERY MARKETS

A party of State officials, headed by Governor Eberhardt, will leave St. Paul on August 14 for a trip to the iron ranges, where the mining properties owned by the State of Minnesota will be inspected. Hibbing and Chisholm will be among the towns visited. This visit may have an important influence upon the future development of mineral lands in that section and consequently upon the market for mining machinery.

The Minneapolis Steel & Machinery Company, Minneapolis, as a result of the large contracts now in hand, is putting on all of the men that it can obtain for structural shop and erection work, including assemblers, fitters, markers and riveters. Skilled men in these lines are not easy to find and it has been found necessary lately to train a good deal of inexperienced labor. The company makes a standing offer to do this in the case of men willing to take an intelligent interest in the work.

The Pelican Rapids, Minn., municipal power plant, which is equipped with a Chandler & Taylor engine of 150 hp., driving a Triumph generator, will be enlarged. The entire contract, including machinery, has been placed with J. W. Shuman, Minneapolis.

The planing mill and woodworking plant of the Park Rapids Lumber Company, Park Rapids, Minn., which recently burned, will probably be rebuilt for considerably greater output and equipped with motor driven machinery.

The county authorities at Great Falls, Mont., have awarded a contract for the construction of 18 steel bridges in that vicinity to the Midland Bridge Company, Kansas City, Mo.

The plant of the Union Light, Heat & Power Company, Fargo, N. D., will be remodeled and its capacity enlarged. The present equipment, which will be added to and partially replaced, consists of direct current generators of 1000 kw. and alternating current generators of 650 kw., all driven by Corliss engines. Steam is furnished by boilers from the shops of the Heine Safety Boiler Company, St. Louis, Mo.

A steel frame mill, with concrete base, which will cost about \$250,000, including machinery, is now being erected at St. Maries, Idaho, by the Milwaukee Lumber Company. It will be the only plant of this most modern type of construction in the Northwest and is to have the best equipment that can be furnished. Electric drive will be used throughout.

It is reported from Winona, Minn., that a manufacturing plant to cost \$600,000 will be built there by the Oxford Linen Mattress Company, whose main office is temporarily located at North Brookfield, Mass. Contracts for the first of the structures to be erected will be let at once.

Extensive improvements are to be made by the Consumers' Power Company to its plant in Faribault, Minn. The system will be changed from water gas to coal gas and three large benches installed.

An electric power and lighting plant is now being installed at Blunt, S. D.

The increasing opportunities for the sale of coal mining and handling machinery in the Northwest are shown by a map just prepared in the office of the State Engineer at Bismarck, N. D., giving the locations of 104 commercial mines in North Dakota alone.

The Business League of St. Paul, 224 Endicott Building, St. Paul, Minn., is having plans prepared for a power plant to be erected in that city.

The Boise Iron Works Company, Boise, Idaho, has been organized and is having a plant erected which will be ready for occupancy by August 25. All necessary equipment has been purchased. The officers of the company are: W. J. Briggs, president and general manager; R. Richardson, vice-president; D. D. Long, secretary and treasurer.

The Farther Central West

OMAHA, NEB., August 8, 1910.

While some dealers report an improvement in trade for the first week of August, as compared with the average of July, the market does not seem to have as yet developed very much activity. Power and pumping machinery unquestionably leads all else, due to buying on the part of municipalities, traction lines and public service companies, but representatives of leading manufacturers, who have called on the responsible officials with the object of closing contracts, complain that it is slow work. Advances from Colorado, Wyoming and Utah are more generally favorable, as considerable ordering is being done for the account of mines, smelters, collieries, hydraulic power plants, irrigation projects, tunnel work, &c. In the Black Hills the renewed activity is also becoming more pronounced, and it looks as though that district would presently assume the relative importance for this market that it had a decade ago.

A motor driven centrifugal pump of 1,500,000 gal. daily

capacity will be installed at the Greenville station of the Sioux City water works, and another similar unit at the Morningside station.

The Sioux City Foundry & Mfg. Company, Sioux City, Iowa, is finding this a particularly good season for boiler and sheet metal work of every description.

It is reported from Lexington, Neb., that the power plant of the Lexington Mill & Electric Company, which furnishes the town with electric lighting, has been destroyed by fire.

The Omaha Motor Car Company, Omaha, has been incorporated here for \$200,000.

Plans are being prepared by the Falkenau Electrical Construction Company, Chicago, for a hydroelectric plant to be operated in connection with an irrigation system known as the Davis and Weber Counties Canals in Utah. The first of the three units proposed will consist of hydraulic turbines operating under a 220-ft. head, driving alternating current generators of 4000 kw.

The Utah Electric Supply Company, Salt Lake City, Utah, which recently came under a new management, has been designated as sales agent for the Ft. Wayne Electric Works, Ft. Wayne, Ind., and is handling a full line of equipment, including generators, motors, transformers, switchboard, &c. Contracts for complete steam and hydroelectric plants are also taken.

The city officials at Strawberry Point, Iowa, have awarded contract for electric generators and other apparatus to the Ft. Wayne Electric Works, Ft. Wayne, Ind. The new power plant building will be constructed and a producer gas engine set furnished by the Minneapolis Steel & Machinery Company, Minneapolis, Minn.

A heating and ventilating plant of considerable size will be needed for the new high school building to be erected in Des Moines, Iowa.

It has been decided by the authorities at Ellsworth, Iowa, to install a pumping plant and water works system there.

The Des Moines Bridge & Iron Company, Des Moines, Iowa, is low bidder for the construction of a pumping plant and water works system at Donnelly, Minn.

The Broken Bow Electric Light Company, Broken Bow, Neb., is proceeding with plans for the erection of a power station.

The power plant of the Griswold Milling & Light Company, Griswold, Iowa, owned by J. W. Daly, which is equipped with direct current Westinghouse generators, will be remodeled to supply alternating current, new machinery being installed for the purpose.

The Adams Company, Dubuque, Iowa, which manufactures several different types of molding machines, is putting on the market a bracket squeezer, built in 24, 30, 34 and 38 in. sizes, which is designed to be attached to the wall, making it possible, where floor space is crowded, to put up one or more additional rows of molds. It is not, however, intended to take the place of stationary or portable squeezers of the standard types which the company also offers.

The Silver Bros. Iron Works Company, Salt Lake City, which has the largest machinery building plant in that section, will build a dredge for municipal service, the contract having been recently awarded.

The construction of a municipal pumping plant is proposed at North Platte, Neb.

The Utah Light & Railway Company, Salt Lake City, Utah, is arranging for the erection of another power station of 8000 kw.

The Salt Lake City, Utah, office of Fairbanks, Morse & Co. is introducing extensively in the West the new Duff-Bethlehem hydraulic jack, brought out by the Duff Mfg. Company, Pittsburgh, which is stated to be forged entirely out of steel. It is designed for heavy service.

The capacity of the Manchester Light, Heat & Power Company's plant at Manchester, Iowa, which is now about 200 hp., will be enlarged. Apparatus already ordered includes a 150 hp. boiler.

The H. S. Brammer Mfg. Company, Davenport, Iowa, whose plant was recently destroyed by fire, has awarded a contract for the construction of a reinforced concrete fire-proof factory building, 80 x 250 ft., three stories, a boiler house, 33 x 56 ft., and a dry kiln, 24 x 100 ft., to the William Allen Son & Company, Peoria, Ill. The company manufactures washing machines, boxes and shipping cases.

The Waterloo, Cedar Falls & Northern Railway Company, Waterloo, Iowa, has begun the construction of a power house to be erected and equipped at a cost of \$500,000. The plant will be equipped with 1500-kw. turbo-generators with necessary accessories, contracts for which have been placed.

The Voss Brothers Mfg. Company, Des Moines, Iowa, manufacturer of washing machines, has awarded a contract for a main factory building, 75 x 200 ft., two stories and basement, a dry kiln and a power house. Upon completion the building will be occupied by the company, which is now located in another part of the city.

The Davenport Ladder Company, Davenport, Iowa, has

THE MACHINERY MARKETS

awarded a contract for the construction of a two-story brick factory building, 100 x 140 ft. The building will be steam heated and will be operated by electric power. There will be installed an electric elevator of special design. Machinery to double the output of the present plant of the company will be installed, and has already been purchased.

The North Pacific Coast

SEATTLE, WASH., August 5, 1910.

Manufacturers and dealers in machinery, metal goods, &c., in this territory are fairly well satisfied, both with the present business outlook and the past month's record. Indeed, considering all of the conditions, they feel that they have come through the summer thus far very well. For all lines of industry the output of local plants has been large for this time of the year, and in some cases production has even been forced beyond what the existing facilities would ordinarily provide. Marine work has helped out a great deal, and steam and electric roads, particularly the former, have turned to local manufacturers considerable business necessitated by the improvements in their shops, terminals and permanent plants or structures of different sorts.

In an address recently delivered by Geo. M. Cornwall, Portland, Ore., before the Pacific Coast Logging Congress, which was held in that city, the very interesting fact was brought out that the application of electric power for logging purposes is likely to be very largely extended in the near future. Two of the largest manufacturers of electrical apparatus, he stated, are experimenting with an electric donkey engine, and in British Columbia a leading company is using an electric road engine with very satisfactory results.

The new shop of the Union Machinery & Supply Company, Seattle, has been furnished with a very complete equipment and will be an important factor in the work of this section.

A new plant 100 x 120 ft. is to be built in Tacoma, Wash., by the Atlas Foundry & Machine Company. Brick and concrete construction is to be principally used.

It is stated here that the Oregon Railroad & Navigation Company has decided upon the construction of a machine shop 130 x 130 ft., with steel frame and brick walls, at La Grande, Ore. Equipment details are not mentioned.

Among foreign orders recently received by the Washington Iron Works Company, Seattle, is one from the colonial government of Java for an engine and other equipment to be used in logging service. This is the second contract of the kind that has been taken from the same authorities.

The power plant of the Grays Harbor Railway & Light Company, Aberdeen, Wash., which is equipped with Allis-Chalmers engines driving Westinghouse and Stanley G. E. generators of 800 kw., will be enlarged and improved. A steam turbine unit may be installed.

It is reported from Dalles, Ore., that the Columbia River Light & Power Company, Portland, will enlarge the capacity of the hydroelectric plant at White River Falls and make other improvements.

The Willapa Harbor Iron Works, South Bend, Wash., is very busy for this season of the year and a good deal of repair work is in hand at the present time.

It is proposed to install at Port Gray, B. C., one of the largest pumping plants in the Pacific Northwest for municipal water service. The cost of the entire system is estimated at \$500,000.

Plans are reported to have been made by Wm. Meyer, Chewelah, Wash., for rebuilding the foundry owned by him, which recently suffered from fire.

The United States Blower Company, Seattle, Wash., is installing a large number of its motor driven exhaust fans for removal of refuse at planing mills in various parts of this section. Direct connected units are the most favored.

The Walther Lumber Company, Spokane, is planning the construction of a large electrically operated timber cutting plant at Ellensburg, Wash.

Fairbanks, Morse & Co., from their headquarters at 315 Occidental avenue, Seattle, are sending out considerable mining machinery. Among recent installations is one of six Nissen stamps and other equipment for an ore reduction plant which Falkenburg & Laucks, Seattle, designed for the Wenatchee mine, near Wenatchee, Wash. In the line of machinery of general utility the company's gasoline engines are selling to excellent advantage, with every indication of a heavy fall trade.

The Industrial Bureau of the Chamber of Commerce, Seattle, will be glad to answer the inquiries of any manufacturer who contemplates building a plant on the coast.

Specifications have been completed for the large addition to the plant of the Fisher Flouring Mills Company, Seattle, and the work of construction and equipment will begin at once. Every mill on the Pacific slope is now rushed with

orders, some large contracts from the Orient having recently been taken.

The Nisqually Iron Works, Tacoma, Wash., incorporated at \$25,000, has acquired the car shop buildings formerly occupied by the Tacoma Eastern Railroad and will act as repair headquarters for a number of logging roads, saw mills and mining companies operating in western Washington. In addition to the machinery with which the shops are now equipped, the company will install a complete boiler shop equipment, including heavy rolls for 1-in. plate, heavy punches and shears and one 48-in. engine lathe.

The Santa Fe Railroad has been granted a permit by San Bernardino, Cal., for the construction of a machine shop to cost \$130,000. The work of construction is now well under way, a permit having been granted for the pits and foundations of the building some time ago. It is estimated that the total cost of the building and equipment will be approximately \$350,000.

San Francisco

SAN FRANCISCO, August 3, 1910.

A barely perceptible improvement is noted in the California market, the various departments occupying about the same relative position in regard to prominence as for some time past. The outlook, as judged by the financial condition of California, is good, and leading bankers express the belief that a great improvement in the industrial and commercial situation will take place within the next 90 days. Considerable buying is being done at present for public works and large projects of a semi-public nature, and conditions favor an increasing demand from mining and lumbering interests, as well as manufacturers in general.

Inquiry for metal working tools continues rather light, though small purchases are becoming more frequent. Business in San Francisco is extremely quiet, and will remain so as long as local manufacturers are under the present labor handicap, but small orders for tools of various descriptions are being placed by several shops in neighboring towns. No large tools have been sold recently, though a few purchases of this character are likely to be made before long by the Government and railroad interests. The volume of country business in small tools is increasing, with prospects of considerable activity in that line, and several large shops in the interior are buying on a moderate scale for immediate requirements.

The most encouraging feature is the continued strong demand for all descriptions of agricultural machinery and implements. Many traction engines, especially of the gasoline type, have been sold recently, for use in lumbering and mining as well as agricultural work. New equipment is being installed in fruit packing establishments all over the State. The development of irrigation in California is responsible for a heavy volume of business. Many large tracts in the Sacramento and San Joaquin valleys are being placed under irrigation and subdivided, giving rise to a demand for all types and sizes of pumps, the manufacture of which is one of the most prosperous industries on the coast. At present many dairies, &c., in these districts are in the market for machinery, alfalfa meal mills are being established and several large packing plants are projected. There are at present a number of inquiries for grape crushers and winery equipment, which is usually in demand at this season.

C. B. Morgan, secretary of the Noble Electric Steel Company, announces that the electric furnace at Heroult, Cal., has passed beyond the experimental stage, and that work has been started on the construction of four additional furnaces, which will give the plant a commercial output of about 100 tons of pig iron per day.

It is announced that the American Can Company will erect a new factory in the Hawaiian Islands, installing machinery of an improved type.

Government Purchases

WASHINGTON, D. C., August 9, 1910.

The Bureau of Supplies and Accounts, Navy Department, will open bids August 23, under schedule 2787, for six propelling machines and one Allen dense air ice machine, and on August 30, under schedule 2791, for furnishing and erecting steam locomotive crane.

The Bureau of Supplies and Accounts, Navy Department, opened bids August 2 as follows:

Class 61.—Nine transformers—Bidder 83, General Electric Company, Schenectady, N. Y., \$737.35; 129, Maloney Electrical Company, St. Louis, Mo., \$700.82; 146, National Electrical Supply Company, Washington, D. C., \$640; 211, Westinghouse Electric & Mfg. Company, Baltimore, Md., \$669.
Class 86.—Twenty-eight differential pulley blocks—Bidder 21, Boston & Lockport Block Company, Boston, Mass., \$328.56; 127, Manning, Maxwell & Moore, New York City, \$656.12.

The Iron Ore Resources of the World

The Available Supply Reckoned Sufficient for 200 Years at the Present Rate of Consumption, While the Potential Supply is Practically Unlimited

Reference has been made in these columns to the ambitious undertaking by the Executive Committee of the Eleventh International Geological Congress, soon to be held at Stockholm, Sweden. This was the preparation of a summary of the iron ore resources of the world. The task which the geologists of Sweden set for themselves was prodigious. In the first place, with the small number of persons available in Sweden, in comparison with the forces enlisted in preparing for the congress in the stronger nations which have entertained it in other years, the Stockholm meeting itself involved a heavy responsibility. Then came the proposition to make this congress memorable by a permanent contribution to the literature of the iron ore supplies of the world. The project was particularly attractive to Swedish mining geologists and mine owners, in view of the prominence their own country has had in recent years as a source of high grade iron ores. The Executive Committee of the congress sent out circulars announcing its purpose in January, 1908. The co-operation of iron ore authorities throughout the world was solicited, official geological surveys being addressed, and in addition many experts in mining geology. The response has been surprising, and the two stout volumes of text and the accompanying atlas, which have recently come from the press, are proofs of the prodigious labors of the Executive Committee and its collaborators. Volume one contains 550 pages, $8\frac{3}{8} \times 11$ in., in addition to 79 pages of introduction and summary, the latter, which is an admirable résumé of the two volumes, being prepared by H. J. Sjöegren. Volume two contains 518 pages. The entire work is edited by J. G. Anderson, general secretary of the congress. In addition to the 42 maps in the atlas, which is $13\frac{1}{2} \times 19\frac{1}{2}$ in., the two volumes contain 28 plates, chiefly maps and views of mines, and 137 illustrations in the text. The publisher is Generalstabens Litografiska Anstalt, Stockholm, and the price of the work is £3.

The chapter covering the iron ores of the United States is prepared by Prof. J. F. Kemp, Columbia University, New York, who has also contributed the information concerning the iron ores of South America (apart from Brazil), Central America, the West Indies and the Philippines. The reader will think it strange that the iron ores of the United States are given but 25 pages, while Canada covers 27 pages, Japan 44 pages, Switzerland 36 pages, France 39 pages and Hungary spreads out over 121 pages. It may be that the caution of the editors in their original circular that no writer should exceed 32 quarto pages, had something to do with the lack of perspective in the treatment of different countries. Professor Kemp seems to have kept within the limits, while the writers for other countries whose iron ore resources, rated by their extent, deserve only a fraction of the space devoted to the United States have rambled on *ad libitum*.

United States

Professor Kemp divides the iron ores of the United States territorially into four groups: A, the Eastern region, which comprises several different geological types of ores; B, the Lake Superior region, which alone holds greater reserves of ores than all the other districts put together; C, the Mississippi Valley, with ore of various kinds; D, the Cordilleran region, which chiefly contains magnetites and hematites. The estimates given are, for the most part, based on the reports on iron ores prepared for the Commission of

Conservation by Dr. C. W. Hayes of the United States Geological Survey. Two classes of ore are included in the estimates: first, actual reserves; second, potential. The former include ores which are considered workable by present methods and which conform generally to present standards as to iron content. In the second class are grouped ores not now available, but that are regarded as a potential supply.

To the Eastern region are assigned Archæan magnetites, Adirondack red hematites, Pennsylvania soft magnetites, brown hematites of mesozoic, tertiary and Cambro-Ordovician deposits, Alabama gray and red hematites, the Clinton red hematites and carbonate ores. The Archæan magnetites which occur in the Adirondack district, are estimated to amount to 20,000,000 tons actual reserve and 30,000,000 tons potential, the latter being ores present in such relation as to be mined in the long run. Of the titaniferous ores in the Adirondacks 90,000,000 tons is put down as available, with a further 100,000,000 tons not available. Of soft magnetites in Pennsylvania, chiefly Cornwall ores, the reserves are put at 40,000,000 tons.

The Mississippi Valley and Cordilleran ores are of relatively small extent. Concerning the Cordilleran region, the following is condensed from Professor Kemp's comment as indicating the basis of the steel industry in Colorado and the possibilities for other Western steel works:

Wyoming possesses the largest and at present the most productive mines in the West. The reserves are estimated at 3,000,000 tons actual and 1,000,000 tons potential. Of the Colorado deposits several which were first worked and were most productive are already exhausted. In the remainder it is estimated there is 4,000,000 tons of potential reserve. In New Mexico the most productive district in the southwestern part of the State is almost exhausted. Utah possesses a large and well opened up deposit in the Iron Spring district containing about 40,000,000 tons, but communications are lacking and therefore must be regarded as potential. In Nevada are several deposits not so well known and at least one in the Humboldt Mountains where the reserves are estimated at 4,800,000 tons. In California a number of deposits are known of which that of the Iron Mountain is estimated at 11,000,000 tons. For all of California the estimate is 65,000,000 tons, of which 15,000,000 tons is available.

In the estimate of Clinton red hematites 355,000,000 tons of available ore is assigned to Alabama, with 150,000,000 tons more as probable, while in New York State 30,000,000 tons is classed as available and 570,000,000 tons as probable.

The estimate for the Lake Superior region, according to ranges, is as follows, only deposits with a percentage of iron upward of 50 being taken into account:

Summary for the Lake Superior Region.—Metric Tons.		
	Available.	Potential.
Michigan:		
Marquette	110,000,000	15,900,000,000
Menominee	80,000,000	7,360,000,000
Gogebic	95,000,000	3,900,000,000
Wisconsin:		
Menominee and Gogebic	40,000,000	4,525,000,000
Minnesota:		
Vermillion	60,000,000	1,005,000,000
Mesaba	3,100,000,000	39,000,000,000
Cuyuna and others	15,000,000	310,000,000
Totals	3,500,000,000	72,000,000,000

The estimated total for the United States is 4,257,820,000 tons actual and 75,105,300,000 tons potential. The following general observation is made concerning the United States: "As regards the future, it may be said that ores of 60 per cent. and above, except as concentrates, are a rapidly vanishing reserve, but that of ores at 50 per cent. there is a supply for many years,

and that at 40 per cent. the reserves are practically inexhaustible."

It may be recalled that Professor Törnebohm's peculiar estimate made for the Swedish Government in 1905, which was widely criticised, credited the United States with but 1,060,000,000 tons of iron ore, only the Lake Superior district and the brown hematites of the Southern States being considered.

Canada and Newfoundland

Dr. Haanel's report on Canada does not deal with figures. He gives a description of the various iron ore districts in Canada with particular reference to the largest ore reserves, which are in the Province of Ontario to the north of Lake Superior.

An interesting report is made by James P. Howley on the ore reserve on Belle Island in Concepcion Bay, near St. Johns, Newfoundland. Up to the end of 1908 some 7,000,000 tons had been taken from these mines. On Belle Island alone the author estimates there are reserves of at least 25,000,000, while in the submarine area of which the Nova Scotia Steel & Iron Company owns 33 square miles and the Dominion Iron & Steel Company 5½ miles, there are enormously greater deposits. Taking all beds over 1 ft. in thickness and assuming that the bands of ore maintain their thickness and stratified character, it is estimated that all the ore still remaining on Great Belle Island amounts to 113,000,000 tons, while in the submarine areas there is 3,522,000,000 tons.

Cuba

Referring to the specular ores in Cuba, those which have been mined on the southeast coast of the island, Professor Kemp estimates about 3,000,000 tons available, with an additional 3,000,000 tons as probable and 4,000,000 tons as possible reserve. Of the brown hematites, he credits 1,600,000,000 tons to the Mayari and Moa districts and 300,000,000 to Baracoa on the east, making 1,900,000,000 of available ore, with a possible addition of 1,000,000,000 tons. The brown hematites contain a large percentage of water and from 40 to 50 per cent. iron, while the percentage of phosphorus is low.

South America

Orville A. Derby, reporting for Brazil, says that the ore bearing formation consists of quartziferous rocks resembling the banded Jasper which in North America has rush large iron ore reserve. The survey made by the State of Minas Geraes shows an iron bearing formation which in the district survey occupies about 5700 sq. km., which is only one-half to two-thirds its whole extent. Three classes of ore are referred to: Quarry ore, which is the finest, containing 50 to 70 per cent. iron, with low phosphorus, is estimated at 2,000,000,000 potential reserve. Rubble ores, which are of lower value, are estimated at 2,000,000,000 tons, and Canga ore, still lower, though containing about 50 per cent. iron, is put at 1,710,000,000 tons.

The data concerning Venezuela are furnished in part by Frank L. Nason, mining geologist, who has examined the only developed area. He says:

In the delta region of the Orinoco River and from the Indian village of Placona on the south bank opposite the larger settlement of Barrancas the low range of the Imataca Mountains runs closely parallel to the river running in the Rio Grande. The mountains are from 15 to 30 km. from the water. The intervening space consists of low swampy land and jungle. The range extends for 100 km. and then dips under the delta. Along it indications of iron ore are reported, but the remoteness from navigable waters has militated against any serious exploration. At Mano, near the junction of the two forks of the Rio Grande, known as Cano Imataca and Cano Corosima, a spur of the range comes within a kilometer of the Cano Corosima. At this point the ore has been explored and the fundamental foundation is decomposed gneiss. On this rests a bed of quartzite about 13 m. thick which contains the ore, a magnetite, or perhaps at times martite, varying from a maximum of 4 m. to a minimum of less than 0.6 m.

Mr. Nason's estimate of the total available iron ore is not over 2,600,000 tons.

The iron ores of Peru and Chile are referred to briefly. In the former the deposits at Cambro Grande are referred to as quite extensive. The ore is red hematite and the estimate is 1,179,675 metric tons. Reference is made to other small deposits, and Peru is credited with a total of 1,600,000 tons of available ores.

Concerning Chilean ores, the information is given by a French engineer, Ch. Vattier, who says iron ore exists in almost all parts of Chile, but for immediate development and for quantity and quality the most important bodies are those named Juan Soldado, Tofo and Huatchalaluma, all in Coquimbo, tributary to its seaboard. The ores are of high grade, running up to 68 per cent. iron, and it is estimated there are some millions of tons.

General Summary

While it is dignifying them far beyond what they deserve, to consider some of the estimates in the volume statistically, it will at least be of interest to reproduce the "World's Summary," as shown by these reports. In the first and third columns below are given the figures for iron ore in million tons; in the second and fourth columns are given the pig iron equivalent, based on the average percentage of iron in the ore:

Summary of Iron Ore Resources of the World.

	Actual reserves.		Potential reserves.	
	Ore. MT.	Iron. MT.	Ore. MT.	Iron. MT.
Europe	12,032	4,733	41,029	12,085 + considerable.
America	9,855	5,154	81,822	40,731 + enormous.
Australia	136	74	69	37 + considerable.
Asia	260	156	457	283 + enormous.
Africa	125	75	Many	Many + enormous.
			thousands	thousands
Totals	22,408	10,192	123,377*	53,136 + enormous.

* Plus many thousands of millions.

The compilers venture the following definite statement in summation of the estimates of their various contributors: "Out of these figures we wish for the moment to direct our attention to those representing the world's total actual known and recorded iron [not ore] reserves, which, according to the table, amount in round figures to about 10,000 MT. As the production of pig iron at present can be put down at about 60 MT, yearly, the supply hitherto known of actual resources would not be sufficient for 200 years on the supposition that the production of pig iron remained stationary."

July Copper Production and Stocks

The Copper Producers' Association has issued the following statement for July:

	Pounds.
Stock of marketable copper of all kinds on hand at all points in the United States July 1.....	168,386,017
Production of marketable copper in the United States from all domestic and foreign sources during July.....	118,370,003
Deliveries of marketable copper during July:	
For domestic consumption.....	56,708,175
For export.....	59,407,167
Total.....	116,115,342
Stock of marketable copper of all kinds on hand at all points in the United States August 1.....	170,640,678

This statement shows an increase of 2,254,661 lb. in the stocks on hand August 1, as compared with July 1, but a decrease in production in July of 8,849,185 lb., as compared with June.

L. Vogelstein & Co., 42 Broadway, New York, have issued a statistical statement giving the apparent consumption of copper in this country and Europe in the first seven months of 1907 and 1910, which shows that while American production increased in the first seven months of this year 35,966,341 lb., the apparent American and European consumption increased 83,972,715 lb.

The No. 1 furnace of the Carnegie Steel Company at Columbus, Ohio, was blown out July 29 and the No. 2 furnace July 31.

June Exports and Imports of Iron and Steel

The June report of the Bureau of Statistics of the Department of Commerce and Labor shows a decrease in both exports and imports of iron and steel as compared with May. The value of the exports of iron and steel and manufactures thereof, not including iron ore, was \$16,503,204 in June, against \$17,658,042 in May, while the value of similar imports was \$3,068,184 in June, against \$3,486,336 in May.

The exports of commodities for which quantities are given totaled 120,596 gross tons in June, against 135,344 tons in May, 117,918 tons in April and 124,753 tons in March. The details of the exports of such commodities for June and for the entire fiscal year ending with June are as follows, compared with the corresponding periods of the previous year:

Exports of Iron and Steel.				
	June,		12 mos. ending June,	
	1910.	1909.	1910.	1909.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron.....	8,854	7,846	79,771	50,178
Scrap	3,940	7,837	18,448	29,029
Bar iron.....	1,396	1,089	16,050	11,625
Wire rods.....	2,498	1,519	24,941	12,715
Steel bars.....	9,444	7,207	90,507	52,668
Billets, blooms, &c....	2,241	10,574	51,554	109,331
Hoops, bands, &c....	579	234	5,238	3,448
Steel rails.....	25,392	20,813	369,578	234,128
Iron sheets and plates..	7,728	7,630	95,621	58,658
Steel sheets and plates..	10,505	8,471	139,429	79,230
Tin and terne plates..	764	629	11,682	5,094
Structural iron and steel	15,756	8,999	120,228	101,653
Barb wire.....	7,167	7,136	75,020	67,299
Wire	7,964	9,608	80,977	73,269
Cut nails.....	367	979	8,906	8,013
Wire nails.....	2,304	2,433	36,398	26,783
All other nails, including tacks.....	699	582	8,365	6,670
Pipe and fittings.....	12,998	11,131	163,776	129,443
Totals.....	120,596	114,717	1,396,489	1,059,234

The imports of commodities for which quantities are given totaled 31,010 gross tons in June, as compared with 45,021 tons in May, 51,438 tons in April and 57,150 tons in March. The details of such imports for June and for the entire fiscal year ending with June, as compared with the corresponding periods of the previous year, are as follows:

Imports of Iron and Steel.				
	June,		12 mos. ending June,	
	1910.	1909.	1910.	1909.
	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron.....	13,988	10,623	237,594	104,655
Scrap	2,240	50	118,610	5,182
Bar iron.....	4,109	818	34,071	14,869
Rails	186	....	7,030	1,292
Billets, bars and steel forms n.e.s.....	2,429	1,103	37,227	12,627
Sheets and plates.....	428	199	6,852	3,167
Tin and terne plates..	5,450	5,647	69,003	52,376
Wire rods.....	1,678	838	15,718	11,358
Structural iron and steel	502	90	10,659	5,475
Totals.....	31,010	19,368	536,764	211,001

The imports of iron ore in June were 193,415 gross tons, against 240,833 tons in May, 206,135 tons in April and 124,714 tons in the month of June, 1909. The total importations of iron ore for the fiscal year ending with June were 2,381,676 gross tons, against 1,015,647 tons in the previous fiscal year and 958,378 tons in the fiscal year 1908. Of the June imports of iron ore 118,850 tons came from Cuba, 48,413 tons from Europe and 26,152 tons from British North America.

The total value of the exports of iron and steel and manufactures thereof, not including ore, for the fiscal year ending with June was \$179,133,186, against \$144,951,357 in the fiscal year 1909 and \$183,982,182 in the fiscal year 1908.

The total value of the imports of iron and steel and manufactures thereof, not including ore, for the fiscal year ending with June was \$38,502,457, against \$22,439,787 in the fiscal year 1909 and \$27,607,909 in the fiscal year 1908.

Pig Iron Production by Grades in 1909

The annual report of the American Iron and Steel Association for 1909, published in the past week, gives statistics of output of various descriptions of pig iron, semi-finished steel and finished iron and steel last year. These for the most part have been printed in *The Iron Age* in the following issues: Pig Iron, February 3, 1910, page 276; Steel Rails, March 3, 1910, page 523; Bessemer Steel Ingots, May 5, 1910, page 1039; Open Hearth Steel Ingots, May 26, 1910, page 1246; Structural Steel, June 30, 1910, page 1574. The separation of the pig iron statistics according to grades, however, is now printed for the first time, and with it are given below similar statistics for the three preceding years:

Grades.—Gross tons.	1906.	1907.	1908.	1909.
Bessemer and low phosphorus	13,840,518	13,231,620	7,216,976	10,557,370
Basic (mineral fuel) ..	5,018,674	5,375,219	4,010,144	8,250,225
Forge pig iron.....	597,420	683,167	457,164	725,624
Foundry and ferro-silicon	4,773,011	5,151,209	3,637,622	5,322,415
Malleable Bessemer ..	699,701	920,290	414,957	658,048
Spiegeleisen	244,980	283,430	121,376	142,831
Ferromanganese....	55,520	55,918	40,642	82,209
White, mottled, direct castings, &c.	77,367	80,508	47,137	56,749
Totals.....	25,307,191	25,781,361	15,936,018	25,795,471

The record production of foundry iron last year is noteworthy. Of interest also is the figure representing the output of malleable Bessemer iron, particularly in its relation to the very large production of that grade in 1907. In the malleable castings industry, if production of malleable Bessemer iron be taken as a criterion, 1907 was far the greatest year, while 1906 was second.

Rails and structural steel are the only finished products of which complete statistics of output in 1909 have been collected. The report, however, gives full statistics concerning finished products for 1908, which were not available when the 1908 report was published last year. They were given in the *Bulletin* later and were reprinted in *The Iron Age* of May 27, 1909, page 1702. The difficulties attending the collection of so large a body of statistics have apparently increased. Yet the United States is still far in the lead among iron and steel producing countries, in the completeness and accuracy of its statistics of the industry and in the promptness with which the figures are printed.

The remaining data concerning the production of rolled products in 1909 will no doubt appear in the *Bulletin* of the American Iron and Steel Association in the near future.

Lake Ore Shipments to August 1

The movement of Lake Superior ore from upper lake docks in July was 6,945,289 gross tons, a falling off of 371,303 tons from the record of June, but an increase of 252,264 tons over the shipments for July, 1909. The total shipments to August 1 this year were 21,863,549 tons, against 15,395,350 tons to August 1, 1909, a gain of 6,468,199 tons. In the following table the shipments are given by ports for the two years:

	July, 1910.	July, 1909.	To Aug. 1, 1910.	To Aug. 1, 1909.
Escanaba	725,123	884,271	2,464,859	2,016,505
Marquette	573,632	450,736	1,723,877	870,961
Ashland	718,300	449,163	2,233,864	1,061,187
Superior	1,262,468	1,111,533	3,895,303	2,576,110
Duluth	2,344,226	2,249,410	7,441,488	5,434,135
Two Harbors.....	1,321,531	1,547,912	4,104,158	3,436,452
Totals.....	6,945,289	6,693,025	21,863,549	15,395,350
Increase, 1910.....	.....	252,264	.....	6,468,199

Ashland is shipping a larger percentage of the total this year than last—10.21 per cent. against 6.89. The percentages of this year's movement credited to the three ports at the head of the lakes—Superior, Duluth and Two Harbors—are 17.82, 34.04 and 18.77, as against 16.73, 35.30 and 22.32, respectively, in 1909.

Cuban Mining Development.—The Committee on Agriculture, Industry and Commerce of the Cuban House of Representatives has reported favorably a bill exempting mining claims and properties, under exploitation or not, from all national provincial and municipal taxes for a period of 10 years, and extending this exemption for a full 10 years to all mining claims and properties put in operation at any time within the original 10-year period. During a period of 30 years all vessels entering Cuban ports in ballast, coming from any foreign or Cuban port, and which clear with cargo of minerals or other products of national mines, are to be entitled to the remission of one-half of the port and tonnage dues paid on entry, and during a similar period minerals and mineral products are to be exempt from payment of export duties. During a period of 10 years, machinery, apparatus and railroad material imported into Cuba for use in mining and metallurgical industries are to pay no more than the minimum duty prescribed for similar articles when imported for use in the most favored Cuban industry.

The World's Production of Calcium Carbide.—Consul-General Richard Guenther of Frankfurt reports the world's production of calcium carbide in 1908 as amounting to 200,000 tons, one-fifth of which was produced in the United States and Canada. The production in the other countries was as follows, in tons: Italy, 32,002; France, 27,000; Norway, 25,000; Switzerland and Austria-Hungary, 20,000 each; Sweden, 12,000; Germany, 9,000; England, 800. There were 70 factories employed in the manufacture of the article. The production has increased very much in recent years.

Steel Rail Contracts in Sweden.—Consul-General E. D. Winslow sends the information from Stockholm that the Swedish State railroads have closed a contract with the Steel Syndicate of Germany for the delivery of 22,800 tons of rails during 1910 at certain seaport towns at \$29.48 per ton. They have also closed another contract for the delivery of the same quantity for the year 1911 at \$32.16 per ton, delivery to be made at certain seaports in the kingdom.

The American Spiral Spring & Mfg. Company, Fifty-fifth and Butler streets, Pittsburgh, has recently erected a brick building, about 50 x 100 ft., in which it will concentrate its wire spring department. The machinery in the older building will be rearranged for a heavier line of work. Contracts for all new machinery have been placed, and will be installed within the next month or so. The company manufactures springs of all kinds and will shortly establish a sales agency in Chicago to handle its Western business. It is operating its plant to practically full capacity.

We are in receipt of a copy of the programme of the outing of the employees of the Dodge Mfg. Company, Mishawaka, Ind., which was held at Winona Lake July 30. This outing is an annual event with the employees of the Dodge Company, whose management was among the first to arrange for an affair of this kind, in which the families of officers and employees enjoy together a day of festivity. The programme comprised 20 contests of a varied character for which prizes were awarded.

The Des Moines Bridge & Iron Company, Des Moines, Iowa, reports the following structural steel contracts recently taken: Ordnance storehouse, Mare Island, Cal., 140 tons; Des Moines Electric Company, 160 tons; steel stack, Kansas Gas & Electric Company, Wichita, Kan., 110 tons; Cathedral of the Immaculate Conception, Wichita, Kan., 100 tons; High School building, Wichita, Kan., 175 tons; Utah Light & Railway Company, Salt Lake City, Utah, 150 tons; Y. M. C. A. Building, Des Moines, 210 tons.

The Beaver Bridge.—The McClintic-Marshall Construction Company, Park Building, Pittsburgh, Pa., has recently issued a brochure descriptive of the new cantilever bridge over the Ohio River, at Beaver, Pa., for the Pittsburgh & Lake Erie Railroad, for which it furnished and erected the steel superstructure. This bridge was built to care for the increased traffic and loadings of the road, and replaced the old single track structure built about 20 years ago. The first two of the 40 pages contain a brief description of the bridge and its method of erection. The remaining pages of the brochure are given up to illustrations showing the progress of the work and some of the members entering into the construction of the bridge. The two central pages contain a double page view of the completed structure and a two-page folding insert gives the principal dimensions of the bridge.

The battleship cruiser *Lion* launched August 6 at Devonport, England, exceeds all battleships in size, speed and armament. She has a displacement of 26,000 tons and is 700 ft. long and 88-ft. beam. The horsepower will be 70,000, developing 30 knots. She will be fitted with the Parsons turbines, and will have 42 water tube boilers, situated amidships. The *Lion* is the fifteenth British Dreadnought to be launched. She was constructed in eight months and cost \$10,875,000.

The Mesta Machine Company, Pittsburgh, has recently shipped the following from its plant at West Homestead, Pa.: A Mesta pickling machine to the Hydraulic Pressed Steel Company, Cleveland; one stand, 28-in. sheet roughing mill to the De Forest Sheet & Tin Plate Company, Niles, Ohio; one 32 x 56 x 60 in. tandem compound Corliss engine to the La Belle Iron Works, Steubenville, Ohio, and a large number of miscellaneous steel castings and gears.

The Pittsburgh Valve, Foundry & Construction Company, Pittsburgh, Pa., has been awarded a contract for nine 58-in. balanced valves for use in regulating the discharge of water in the reservoirs for irrigation in South Dakota and Wyoming. The valves are of cast iron and bronze construction, specially designed by the Reclamation Bureau. The contract price is \$35,010, and the valves are to be completed and shipped by February 1, 1911.

President A. C. Rosencranz of the Vulcan Plow Company, Evansville, Ind., recently made a bonus distribution of \$8500 to 103 of the 124 employees. The bonus plan has been in force four years. The first year the distribution was \$2500; the second year, \$3500, and the third, \$5000. It is a good conduct bonus, depending on the general deportment and interest of the workmen, number of days missed from work, &c.

The largest single contract for steel cable ever placed in Vancouver, B. C., is about to be awarded by the Western Canada Power Company, Ltd. The order will call for 40 miles of $\frac{3}{8}$ -in. for early delivery. The cable will be used for the ground and guy wires of the transmission line, which the company now has under construction, from Stave River Falls to Vancouver.

At the annual meeting of the Pittsburgh Forge & Iron Company, held in Pittsburgh August 2, the retiring Board of Directors was re-elected. F. E. Richardson is president and treasurer, and W. I. Miller is secretary.

The third annual picnic of the Mesta Machine Company was scheduled for Wednesday of this week at Homestead Park, Pa. The programme included athletic events, ball game, dancing, music, &c.

Technical Education in Canada

TORONTO, August 6, 1910.—The Canadian Royal Commission on Industrial and Technical Education, appointed at the beginning of the summer, has been investigating conditions in Nova Scotia. It will complete its tour of the Maritime Provinces before taking up its work in the other provinces of the Dominion. Its inquiries so far have had to do with the steel and coal industries in Cape Breton and in the Pictou district. The steel works at Sydney were inspected, and afterward hearings were had of the steel and coal men there and at New Glasgow. Sydney mines were also visited. Many practical coal and steel men gave evidence at the hearings. All expressed the opinion that technical training is absolutely necessary for the proper progress of the industries with which they are connected.

The commission is to make a very thorough study of the needs of industry and commerce in Canada in the matter of technical education. It is then to look into the systems in vogue in other countries, especially those in which the progress of manufacturing has been most marked in recent times. The United States, Germany, the United Kingdom and other countries will be visited. The commission is composed of representatives of Canada's education, labor, agriculture, mining and manufacturing interests.

The idea of appointing the commission was strongly advocated on both sides of the House of Commons last session, and it is expected that the report, when made, will be followed by the Government making very generous provision for technical education. C. A. C. J.

Riter-Conley Contracts.—The Riter-Conley Mfg. Company, Pittsburgh, Pa., has recently taken some large contracts, among which are the following: Rebuilding the blast furnace of the Emporium Iron Company, Emporium, Pa.; rebuilding No. 2 Isabella stack of the Carnegie Steel Company, Sharpsburg, Pa.; three large oil tanks for the Atlantic Refining Company, Pittsburgh, Pa.; gas holder with a capacity of 3,000,000 cu. ft. for the St. Paul Gas Light Company, St. Paul, Minn.; 1000 towers for carrying high tension transmission wires for companies in the West and Canada; 400-ton metal mixer for the Republic Iron & Steel Company, Youngstown, Ohio; 300-ton metal mixer for the Alan Wood Iron & Steel Company, Conshohocken, Pa.; about 15,000 ft. of riveted pipe for a water main in New York City. With numerous smaller orders on its books the company is operating its plants in Pittsburgh and at Leetsdale, Pa., to full capacity.

A Wellman-Seaver-Morgan Booklet.—The Wellman-Seaver-Morgan Company, Cleveland, devotes a 48-page booklet, 6 x 9 in., to hoisting machinery, steam and electric. Illustrations and descriptions are given of a number of types of hoist used in deep mines in the West, and an installation made by this company for the Hecla mine at Burke, Idaho, is described with special detail. In this case a double reel hoist is used directly connected to a 550-hp., 600-volt. d. c. motor operating at a normal speed of 60 rev. per min. The current for this motor is furnished through a motor generator flywheel set. The maximum hoisting speed is 2400 ft. per minute. Each of the reels is fitted with a Webster-Camp-Lane band friction clutch and a post brake. This installation was inspected with particular interest by the members of the American Institute of Mining Engineers on their 1909 tour.

The Canadian Shipbuilding Proposals.—To the Canadian Government's inquiries of shipbuilders as to the probability of their competing for the contracts to be given out for the construction of the naval vessels,

provided for in the last session of Parliament, several replies have been received. Three Canadian and two British firms have indicated their desire to tender, and intimations have been given as to the possibility of an amalgamation of two or more of the interests heard from. The Government itself might favor a joining of forces for the purpose of building the ships, believing that in that way the work can be done more economically and with a minimum of publicity as to the plans of the vessels.

Southern Iron & Steel Company Changes

Announcement is made of the resignation of W. H. Hassinger as president of the Southern Iron & Steel Company, Birmingham, Ala., effective in September. W. W. Miller, vice-president and general counsel of the company, has resigned as vice-president and will be succeeded by James Bowron, who becomes vice-president and treasurer, while A. R. Forsyth will be secretary. Mr. Bowron was in charge of the finances of the Tennessee Coal, Iron & Railroad Company during the presidency of N. Baxter, Jr. It is stated that C. A. Grenfell, who has been at Birmingham for some time and is a member of the Board of Directors, representing English security holders, will sail for Europe shortly to report to the foreign interests.

A statement has been issued in New York by the Southern Iron & Steel Company referring to Mr. Hassinger's retirement and to the present status of the company's operations. It says that Mr. Hassinger, having completed all the work of construction and improvement contemplated under the reorganization of the company, and having gathered together a competent organization under Vice-President F. B. Keiser and having actually started the wire mills of the company, is relieved from his responsibilities at his own request. It is added that though he ceases to be an officer, Mr. Hassinger will continue to give advice and to aid in promoting the success of the company. The expenditures of the past year in new construction and betterment have been above \$2,500,000. Sales of wire fence, barb wire and nails are reported up to expectation, but collections are slow. The company reports free net cash and quick assets of \$1,866,020 on July 1, against which there is \$947,151 of unsecured current liabilities.

The directorate of the Southern Iron & Steel Company includes Cornelius Vanderbilt and R. T. Wilson. The firm of Kean, Van Cortlandt & Co., New York, which was largely interested in the original Southern Steel Company and its reorganization, was dissolved a few months ago, it is stated, Mr. Van Cortlandt retiring to take a long vacation in Europe. D. G. and G. L. Boissevain, the former of whom was also active in the Southern Steel Company, withdrew at the same time. Hamilton F. Kean and Moses Taylor, neither of whom is a director in the Southern Iron & Steel Company, joined with J. R. Swan in forming the Stock Exchange firm of Kean, Taylor & Co.

The Illinois Nail Company, Chicago, Ill., has purchased the property at the southeast corner of Grand and North Forty-sixth avenues, 188 x 494 ft., upon which it will build a new plant, including a one-story factory and a three-story warehouse at a cost of about \$50,000. The new plant will not affect the operations of the company's existing plants, one of which is located at the Stock Yards, and the other at Dick street and Chicago avenue.

The Lackawanna Iron & Steel Company blew out its No. 1 Bird Coleman Furnace, at Cornwall, Pa., August 1. It now has but two of its furnaces in the Lebanon Valley in blast, these being the Colebrook stacks at Lebanon.

Personal

Rudolph Erickson, formerly chief engineer for the Jones & Laughlin interests on the Michigan iron ranges, has been appointed superintendent of the Davidson Ore Mining Company, a New York State Steel Company mining corporation, which is operating the Gleason mine at Iron River, Mich.

D. R. Day has resigned his position as secretary and general manager of the Union Malleable Iron Company, Moline, Ill., to assume the management of the Oliver Mfg. Company, Chicago. He will take up his new duties about August 15.

Montgomery Hallowell has been appointed general advertising manager of the United States Motor Company, 505 Fifth avenue, New York City. He will assume his duties August 15, and will have supervision of the advertising and publicity of the parent company and the following concerns affiliated with the organization: Maxwell-Briscoe Motor Company, Columbia Motor Car Company, Brush Runabout Company, Alden Sampson Mfg. Company, Dayton Motor Car Company, Courier Car Company, Briscoe Mfg. Company, Gray Motor Company and Providence Engineering Works.

L. R. Tustin has been appointed assistant superintendent of the armor plate department of the Homestead Works of the Carnegie Steel Company, Homestead, Pa., to succeed L. H. Bowman, who recently resigned.

James W. Davis has been appointed manager of the New York branch of L. & I. J. White Company, Buffalo, manufacturer of edged tools and machine knives, succeeding the late J. H. Dillon. The New York branch is at 45 Centre street. Mr. Davis has been for the past eight years general export buyer for W. R. Grace & Co., New York, making hardware lines his specialty.

Frank F. Amsden, for several years superintendent of Paxton furnaces of the Central Iron & Steel Company, Harrisburg, Pa., has been appointed superintendent of the Federal Furnace Company, whose two blast furnaces are at South Chicago, Ill.

J. O. Henshaw, New York resident partner of Hickman, Williams & Co., has returned from a trip to Europe.

The Pan-American Congress in session at Buenos Aires, Argentina, on August 4 voted a gold medal to Andrew Carnegie for his services to the cause of humanity. It will be the joint gift of all the American republics.

Otto Hahn, London, England, representing European interests connected with coke oven by-product manufacture, is making a tour of the iron and steel districts of this country.

Prof. Henry M. Howe is in Europe, and will return about the middle of September.

H. A. Croxton has resigned as president of the Massillon Iron & Steel Company, Massillon, Ohio. He is succeeded by C. M. Russell.

James A. Campbell, president; Geo. E. Day, secretary, and Richard Garlick, treasurer, of the Youngstown Sheet & Tube Company, acted as hosts at an informal luncheon given to the steel fence sales agents of that company in the Youngstown Club, Youngstown, Ohio, last Thursday. Matters of special interest to this department were discussed.

The New York sailing time of the excursion in connection with the Canal Zone meeting of the American Institute of Mining Engineers has been changed from October 29 to Friday, October 21, 1910. Returning the party will arrive at New York about November 15. Nearly 100 members and guests have already secured accommodations for the trip.

Chateaugay Pig Iron

Some years ago the Chateaugay Ore & Iron Company produced at Standish, N. Y., charcoal pig iron running low in phosphorus. The operation was a small one, and the furnace was remodeled and enlarged about four years ago and leased to the Northern Iron Company, which has since been operating it with coke as fuel. The ores used are exclusively concentrates, produced from the Chateaugay mines at Lyon Mountain, N. Y.

To use these ores more effectively, an extensive nodulizing plant was erected at the furnace. After screening the finer concentrates are nodulized, and at present the mixture is composed of these nodules and raw concentrates. The capacity of the furnace—in fact, the average product—is now 160 tons per day. By judicious selection of raw materials and careful furnace management, the phosphorus in the iron has been gradually reduced, and has been brought to an usually low point. The following table shows the actual results obtained during the latter half of July:

Date.	Phosphorus.	Silicon.	Sulphur.
July 16.....	0.021	2.15	0.012
July 17.....	0.025	2.10	0.0165
July 18.....	0.024	3.00	0.0115
July 19.....	0.025	2.20	0.013
July 20.....	0.025	2.08	0.0205
July 21.....	0.026	1.10	0.016
July 22.....	0.027	2.67	0.012
July 23.....	0.025	1.05	0.0165
July 24.....	0.020	1.90	0.017
July 25.....	0.021	1.85	0.017
July 26.....	0.021	1.65	0.0165
July 27.....	0.022	2.00	0.0175
July 28.....	0.021	2.30	0.0145
July 29.....	0.023	1.30	0.020
July 30.....	0.022	2.15	0.0155
July 31.....	0.020	1.48	0.012

During the present month the phosphorus has been still further reduced, many of the casts showing this element to run under 0.020 per cent., and the average sulphur is quite considerably under this figure.

It is stated that this iron is lower in phosphorus than any which has ever been produced in the United States or Great Britain, and approaches very closely some of the famous brands of low phosphorus Swedish charcoal irons.

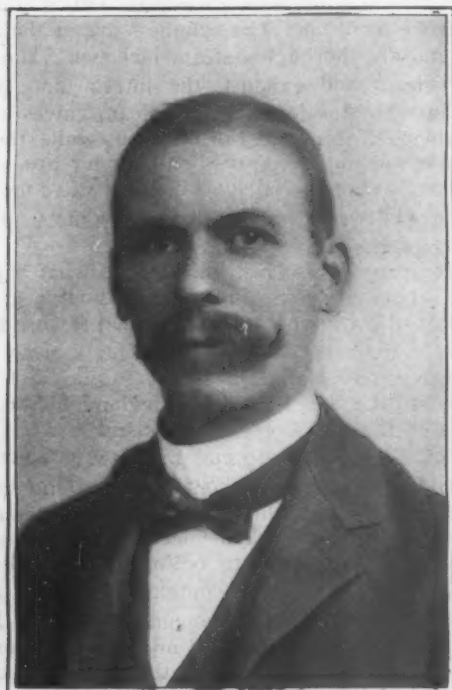
The American Society of Engineer Draftsmen.—On June 18 steps were taken to form a permanent organization to be known as the American Society of Engineer Draftsmen, embracing every branch of the profession, including mechanical, electrical, civil, architectural, marine, sanitary, automobile and aeronautical draftsmen. The first meeting of the society was held July 27. The formation of this organization, which was conceived by E. Farrington Chandler, a well-known designer and inventor, marks the first effort to form a national society among draftsmen, who have long felt the need of an organization, both from an engineering and a fraternal standpoint, which would be the means to establish a higher professional standing and place them on a recognized professional plane in the field of engineering. A feature of the society is the opportunity offered juniors, affording means by which they may become familiar with the demands of practice in the drafting room while students or employees in other branches of industrial work, as is also an employment bureau co-operating with employers. E. Farrington Chandler is president, Wm. B. Harsel is vice-president and Henry L. Sloan is secretary and treasurer, with headquarters at 116 Nassau street, New York.

The Southern Iron & Steel Company now has one blast furnace in operation—that at Trussville, Ala.—the Chattanooga furnace having blown out at the end of June and the Alabama City furnace early in July.

Obituary

WALLACE A. STEWART

Wallace A. Stewart, vice-president of the Stewart Iron Works Company, Covington, Ky., and president of the Union Iron Works Company, Cincinnati, Ohio, died, after a lingering illness, at his residence in Covington, August 3, aged 52 years. He was born in Cleveland, Ohio, and when three years old the family removed to Cincinnati. He went into business, as an iron manufacturer, about 25 years ago, and with his brother, Richard C. Stewart, established a plant at Wichita, Kan.; five years later they moved back to Cincinnati and founded the Stewart Iron Works Company and its subsidiary companies, the Stewart Jail Works Company and Stewart Iron Fence Company, whose joint factory is in Covington. Afterward they organized the Union Iron Works, whose plant is located in the manufacturing district of Cincinnati. Mr. Stewart was a member of the leading clubs of Cincinnati and



WALLACE A. STEWART.

was considered one of the ablest and most progressive men in his line in the Middle West. In practically all his business ventures he was very successful. He leaves a widow, a son and a daughter.

JAMES RILEY, for many years a prominent figure in the iron industry of Great Britain, died at Harrogate, Yorkshire, England, July 15. In 1887 he received the Bessemer medal of the Iron and Steel Institute "for his valuable services to the open hearth industry, especially in developing the manufacture of mild steel of high quality." He was for a number of years manager of the works of the Steel Company of Scotland and secured a wider use of its mild steel for boiler making, bridge building and other purposes. In the 1890's he began to manufacture iron and steel on his own account, at the Richmond Works, Stockton-on-Tees. He was first president of the West of Scotland Iron and Steel Institute and a member of the council of the Iron and Steel Institute. Having risen from the ranks, he took an active interest in the welfare of labor and was a member of various boards of conciliation.

AARON WHITE COOK WILLIAMS, Hartford, Conn., founder and for years treasurer and general manager of the Capewell Horse Nail Company, died August 4, aged 76 years. He was born in Manchester, Conn.

His early life was associated with the silk business of his native town, chiefly in the mills of Cheney Bros. In the early sixties he founded, with several others, the Williams Silk Mfg. Company, Bridgeport, Conn., which prospered under his management. In 1869 he retired from the business and went abroad, being engaged in mercantile and manufacturing pursuits in France and England. Twenty years later he returned to this country and located in Hartford, intending to devote the remainder of his life to leisure. But he soon became interested in the establishment of the Capewell Company, and was made its treasurer and general manager, offices which he held until his death. He was a director of the First National Bank. He leaves a widow.

CHARLES H. KIMBALL of the Kimball & Chappell Company, Chicago, manufacturer of metal beds, died July 30.

FREDERICK B. BLINN died at Summit, N. J., August 7, of tuberculosis, aged 40 years. At the formation of the United States Steel Corporation in 1901 he was made assistant secretary and stock transfer agent, and continued in that position several years. In the past two or three years he had not been active owing to failing health.

JAMES LATHWOOD died August 1, at his home in Pittsburgh, aged 70 years. He had long been identified with the Central Foundry Company, Pittsburgh.

Western River Transportation Reviving

There are indications of a revival of interest in river transportation throughout the West. The shops which build steel boats and barges for traffic on the Ohio and Mississippi rivers have contracts on their books which will engage their capacity all the way from eight months to two years.

A packet company operating on the Mississippi River is in the market for a steel passenger boat with decks 60 x 250 ft., on which immediate construction is sought, but has been unsuccessful in placing the contract. This particular boat is wanted for excursion traffic, with clear decks for dancing and only a small amount of stateroom construction. The demand is equally urgent, however, for freight barges and tow boats, and owing to the scarcity of timber of the quality desired for this work steel construction is universally preferred.

In the Pittsburgh district large industries have found large steel barges very economical for handling bulk freight on the rivers, while in the Mississippi Valley the agitation in recent years for a deep water way from the lakes to the gulf has turned the attention of merchants and shippers to the advantages of the river barge. A local company has been operating barges successfully for two years between Kansas City and St. Louis, and a larger corporation was recently organized to operate on the Mississippi River. At Lockport, Ill., a connecting link has been completed between the new Drainage Canal and the old Illinois and Michigan Canal, so that small barges and boats drawing not over 4½ ft. can pass from Chicago to the Illinois River, and thence to the Mississippi. It is expected that this route will be utilized commercially in the near future.

Building operations in July as indicated by returns to *Bradstreet's* from 68 cities show a falling off of 24.3 per cent. from June of this year and 22.2 per cent. from July, 1909. The total expenditures were \$47,924,665, against \$63,343,600 in June and \$31,627,568 in July, 1909. The falling off in building operations in New York is responsible for \$13,160,000 of the loss as compared with July of last year, the total being \$12,573,620, against \$25,733,373 in July, 1909, and \$17,040,505 in June, 1910.

A Self-Propelled Machine Shop

The North Coast Railroad, which is steadily pushing its line west from Spokane through central and western Washington to the Cascade range to meet the increasing demands of the great Northwest, is in itself a very interesting engineering operation. All the latest appliances which will assist in the construction of the road are employed, and probably one of the most interesting is the self-propelled machine shop, whose



Fig. 1.—Self-Propelled Machine Shop Driven by a 12-Hp. Gasoline Engine, Built by Fairbanks, Morse & Co., Chicago, Ill.

exterior is shown in Fig. 1. Fig. 2 is an interior view, and gives some idea of the manner in which the equipment is arranged.

As it would be some time before a permanent shop for repairing locomotives and other equipment could be located and erected, recourse was had in the interval to some other way, and a combination motor and machine car was decided upon as being best suited to perform this work. The motive power is supplied by 12-hp. Fairbanks-Morse vertical gasoline engine, built by Fairbanks, Morse & Co., Wabash avenue and Eldredge place, Chicago, Ill. This engine which is shown at the left of Fig. 2 is oil cooled, and is connected through a friction clutch to a line shaft for driving the various tools. Power is transmitted to the wheels of the car



Fig. 2.—Interior of the Self-Propelled Machine Shop of the North Coast Railroad.

from the shaft by a chain and sprocket. This enables the operator to do switching with the car and also to move from one station to another without the assistance of a locomotive at a speed of from 8 to 10 miles per hour.

The tools in the car are those ordinarily employed in making emergency repairs to railroad equipment, and include one 23-in. engine lathe, one 16-in. shaper,

a 1½-in. bolt cutter, a 6-in. pipe threading machine, an emery wheel and a 22-in. vertical drill press. In operation the car has proved very economical. During one day when the engine was running 12¾ hours, the amount of fuel consumed was only 4 gal. of gasoline, and during this time the two men connected with the car were running the different tools to handle the repair work as it came in. During the nine months that the engine has been running, it is said that not one cent has been expended for repairs. Beside this motor driven machine shop, the equipment of the road includes two gasoline motor passenger cars for handling the local business.

Hooven, Owens, Rentschler Engine News

The Hooven, Owens, Rentschler Company, Hamilton, Ohio, has nearly ready to ship to the water works plant of the borough of Brooklyn, N. Y., a solid trainload of power plant equipment, consisting of four heavy duty vertical triple expansion engines. The high pressure cylinders are 28 in. in diameter, the intermediate 50 in. and the low pressure 80 in., all with a common piston stroke of 60 in. The cylinders are of the built-up type and are thoroughly steam jacketed. The high pressure steam and exhaust, the intermediate steam and exhaust and the low pressure steam valves are of the multiported Hamilton-Corliss type, while the exhaust valves of the low pressure cylinder are of the poppet type, having special quick opening valve mechanism. The total weight of these engines figures up over 640,000 lb. each.

The company is also just finishing up what is probably the largest steam cylinder of its kind ever cast in that part of the country. It is a low pressure cylinder 86 in. in diameter by 60 in. long, for a cross compound, heavy duty Hamilton-Corliss engine, and is to be shipped to the San Francisco, Oakland & San Jose Consolidated Railway Company, Oakland, Cal. It took 42 tons of a semi-steel special mixture to pour this casting and it came out without a flaw. One special feature is that the steam inlet and exhaust port are on one side of the cylinder, thus necessitating a belt of metal extending from top to bottom of the cylinder. This makes the cylinder self-contained and does away with the independent piping commonly used in large work of this kind. The casting mixture used for the cylinder developed a tensile strength of over 36,000 lb. This engine will be direct connected with a 2700-kw. generator and has a rated horsepower of 4000 at economical point of cut-off, and is designed to take care of an overload up to 9000 hp.

The power equipment of the company's plant is being increased by the addition of a 250-hp. boiler recently purchased.

National Roll & Foundry Contracts

The National Roll & Foundry Company, Pittsburgh, Pa., reports that during July its plant at Avonmore, Pa., produced nearly 400 tons of rolls for various purposes. It is now building a lever shear intended for motor drive, to cut up to 4 in. square, for the Grand Rapids & Indiana Railway Company, Grand Rapids, Mich. It also has an important contract for eight stands of 20-in. mills, with four stands of 20-in. pinions, for shipment to the new Milwaukee plant of the Globe Seamless Steel Tube Company, Chicago, delivery to be made about October 1. It is also building a complete combination grinding and polishing machine for the Pressed Prism Plate Glass Company, Morgantown, W. Va., the deck of which will be 26 ft. 6 in. in diameter and will weigh 70,000 lb., while the total weight of the machine will be approximately 300,000 lb.; the bridge is of special design and the machine will be operated by electric motors. This equipment will also be delivered about October 1. The company is operating its plant to capacity.

Steel Balls

Methods Employed by the Standard Roller Bearing Company in Their Manufacture

BY J. F. SPRINGER, NEW YORK.

The great bicycle craze at the close of the last century created a tremendous demand for steel balls. At practically every point in a bicycle where one piece of metal turned upon another a ball bearing was inserted in order to eliminate to the utmost the possibilities of friction, and the great degree of perfection which the bicycle rapidly attained was in large part due to anti-

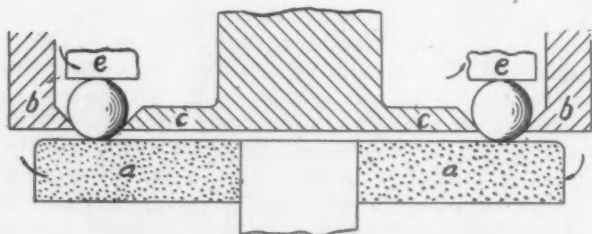


Fig. 1.—Sketch Showing First Stage in Grinding Balls.

friction bearings. A great deal of trouble was experienced with the failure of balls, but this never assumed very serious proportions, as the loads and speeds at the bearing points of a bicycle were very moderate. With the automobile a different problem has arisen. Here high speeds and heavy loads are the order of the day, but these conditions alone would not be excessive. It is the shocks and jars and fluctuations of the load which go to make the service in the hub of an automobile wheel one of the most exacting to which a ball bearing is put. While the ball bearing had succeeded wonderfully well with the bicycle, many disappointments were experienced in automobile use.

It is very desirable to introduce antifriction bearings in machinery in general. At first their success was very doubtful and ball bearings came into some degree of disfavor for serious machinery uses. Their obvious advantages has led to continued study and experiment to ascertain and correct the defects in the design and manufacture of ball bearings. As a result of this investigation it has become very evident that toughness, hardness and accuracy are the controlling

factors in the manufacture of the balls. A ball is subjected not merely to a steady load, but often to severe shocks and strains. Various endeavors have been made to meet this requirement, and the difficulty is increased because hardness must not be sacrificed. With the recent developments in alloying tool steel very tough balls are now made. The Standard Roller Bearing Company, Philadelphia, Pa., whose methods of ball manufacture it is proposed to describe, has produced an alloy of tool steel and chrome which enables it to make a ball capable of withstanding a load very greatly increased over that possible with the ordinary pure tool steel ball and permits glass hardness to be attained if desired. The service to which a ball is to be put imposes the conditions as to its hardness and toughness, so that balls are made to suit the service. As to accuracy, it is now possible to produce balls whose variation from the standard is within the limit of 0.0001 in., which is no more than is demanded by the more exacting applications.

There are three general classes of materials which are employed in the manufacture of steel balls—machine steel, tool steel, and tool steel alloy. The first of these is not used by this company. It is important that

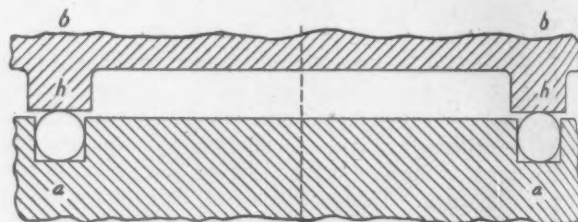


Fig. 3.—Second Stage in Grinding Steel Balls.

the material shall be even grained and without defects. Pure tool steel makes an excellent ball capable of withstanding rough service and possessing a high degree of hardness, but it is liable to fracture under the most severe stress and so is surpassed by the more modern product, alloyed tool steel. This is the result of considerable experiment and increases to a very marked degree the efficiency in point of load sustaining capacity. That is to say, balls of this material may be extremely hard and extremely tough at the same time. It is easy to see why balls should have toughness, but perhaps it is not quite apparent why hardness is necessary. It is an indispensable requisite, as without it a ball would soon lose its sphericity and introduce complications. Even if sphericity be maintained, any wear at all becomes a detriment, especially in nonadjustable bearings.

Forming the Balls

In giving form to a ball there are four initial processes—hot rolling, pressing, forging, and turning. This company utilizes the cold pressing process in giving shape to balls of from $\frac{1}{8}$ to $\frac{3}{8}$ in. in diameter. Tool steel in the form of wire is passed into a machine which straightens it and cuts it up into small lengths, whose diameter is considerably less than that of the balls to be formed while the length is greater. These short lengths of wire are now fed to an ingenious machine, which seizes one of the bits of steel by a horizontally oscillating finger and carries it vertically to a position between the two parts of a forming die. These are cup shaped and press the piece of wire into a rounded bit of steel in about a second.

By another method certain balls of $\frac{1}{2}$ -in. diameter

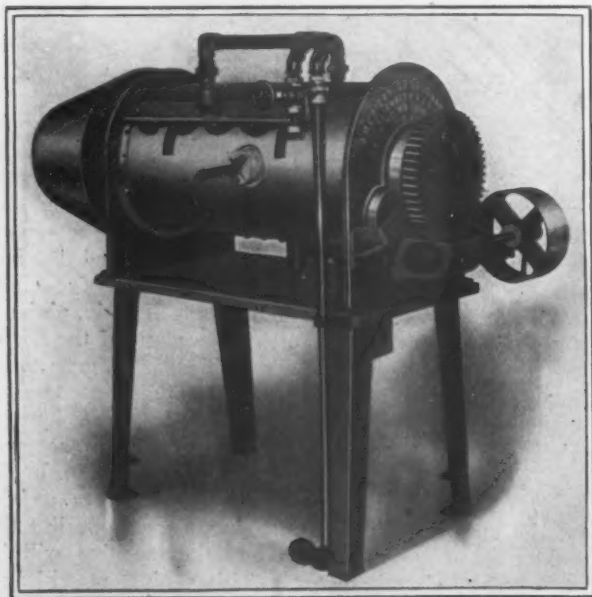


Fig. 2.—Gas Ball Hardening Furnace, Made by the American Gas Furnace Company, New York City.

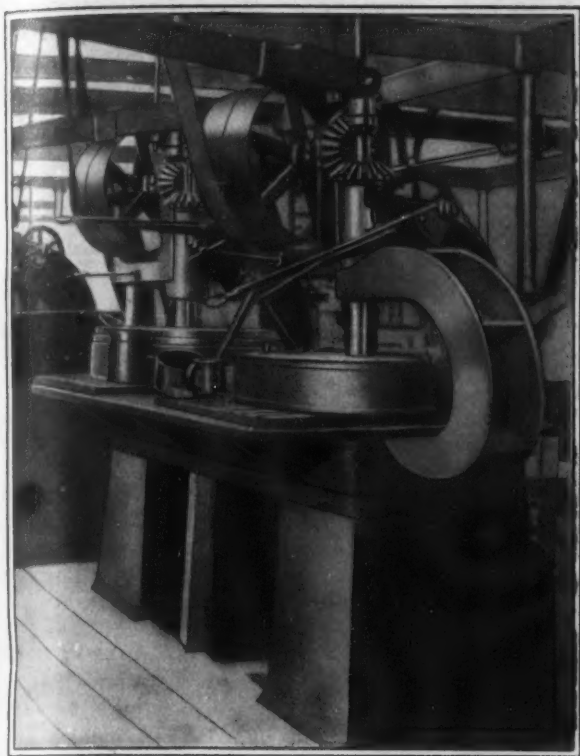


Fig. 4.—Wet Ball Grinding Machines.

and under are turned in an automatic lathe. It is said that it is possible to form 30,000 balls in one day with a single machine. It would seem that a turned ball would be better than a cold pressed one, as the process does not affect the grain in different parts of the ball unequally to a considerable extent, while cold forging would appear to produce a ball markedly different in its various parts.

The last process is hot forging, which is employed with the larger sizes of plain tool steel and all sizes of the alloy balls. A round bar of steel is passed while red hot between two dies which are each in the form of a string of cups. A number of blows is struck, the workman turning the bar on its axis between them. In this way a series of knobs attached to each other and to the remainder of the bar is formed in a short time. This is then placed in position between two dies in a second machine, whose upper die has a string of cups corresponding to the knobs, while the lower die has circular perforations also corresponding to the knobs. When the upper die is forced down the knobs are discharged

through the perforations as balls by the shearing action of the dies. This method apparently affords an opportunity for the grain of the metal to recover from the disturbances set up by the blows of the forging die.

Grinding the Balls

Whatever the method employed to shape them, the balls are only at the beginning of their career. They are now roughly spherical and in order to bring them closer to the finished form and size they are treated to a grinding process. The balls are ground, a lot at a time. For example, about 135 $\frac{1}{4}$ -in. balls are ground dry by a single machine having one emery wheel simultaneously.

By referring to Fig. 1 the operation of this machine may be readily understood. The emery wheel *a*, carried on a vertical spindle, rotates in the direction of the arrows. A groove open at the bottom is formed by *b* and *c*, and *e* is a rotatable ring which completes a kind of raceway in which the balls are confined. When the balls are placed in the raceways and the machine set in motion, they are ground from below by the rapidly revolving emery wheel through the opening in the



Fig. 6.—Ball Gauging Machines.

bottom of the groove. In a few moments the lot of balls has been sufficiently ground. The machine is stopped and the emery wheel lowered. The parts *b* and *c* can be moved independently of *a* or of each other. The balls are discharged by widening the groove sufficiently into a pan which has been previously placed between *b*, *c* and *a*. The pan is then swung clear and may be discharged by displacing a removable bottom.

Hardening and Annealing

This grinding is not the finishing process, as the balls are still soft. The work accomplished is a machine operation, and leaves the balls very fair spheres, but by no means in that perfect condition in which they are used. The balls have now to be hardened and annealed. For hardening different processes are used, dependent upon conditions, water being used in some cases, while for others oil is employed. For some balls the heating is accomplished in oil heated ovens, while for others specially designed machines are used. The former process is by hand, and the proper heat is determined by the color. The red hot balls are placed in open trays, and the whole then transferred to the interior of an open oven. Upon removal the balls are dumped into the cooling liquid. The process of machine hardening is accomplished by gas heated furnaces. These machines are practically automatic and permit very exact regulations of temperature which is an important point. Fig. 2 shows one of these built by

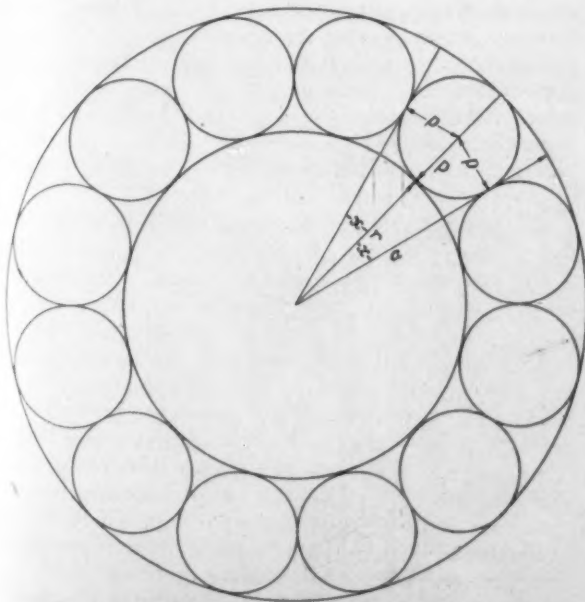


Fig. 5.—Diagram of Ball Bearing.

the American Gas Furnace Company, 24 John street, New York City. In drawing the temper, the special use to which the balls are to be put as well as the material of which they are made control the treatment, some balls being left glass hard, while others are given less hardness.

Wet Grinding

The next operation is the final one, and is performed by the wet grinding machines shown in Fig. 4. These consist essentially of two parts. The lower contains a square-bottomed or U-shaped annular groove. The balls to be finished are placed in this groove with a supply of emery powder mixed with oil. Above the

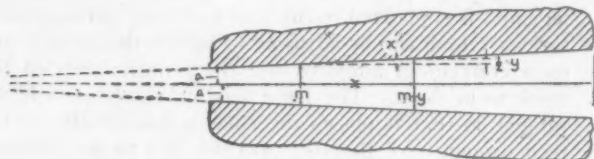


Fig. 7.—Slit Used in Gauging Balls.

U-shaped groove is fitted a disk having a circular ridge fitting over the groove. In operation the lower part remains fixed, while the upper disk is rapidly revolved.

The essential parts of this machine are shown in Fig. 3. Here *a a* is the lower portion containing a groove. Above this fits the upper portion *b b*, having the projection *h h*. This operation is not expert work contrary to what might be supposed. In fact, a very low class of labor is employed in carrying it out. The brains are in the mechanical arrangements and in the supervision. That this method accomplished good results may be judged by the product. The balls ground do not come out absolutely standard size, nor is this necessary as will be seen from considerations to be pointed out now.

Ordinarily it is a matter of indifference whether

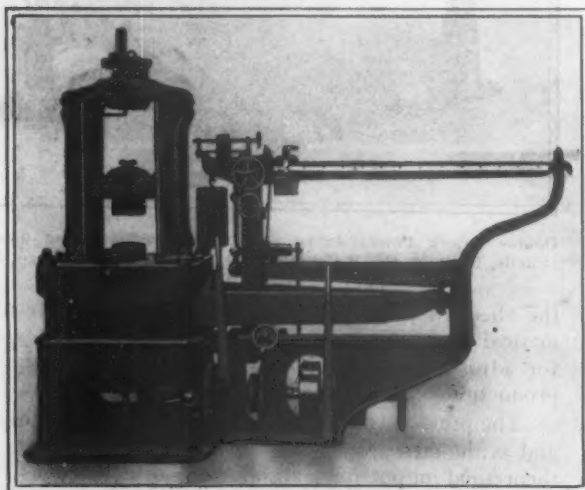


Fig. 8.—Ball Testing Machine, Used by the Standard Roller Bearing Company, Philadelphia, Pa.

the balls in any given ball bearing are 0.001 in. above or below standard, or some intermediate dimension if all the balls in one circuit are alike. In constructing ball bearing where there are two points of contact located in a perpendicular to the axis of the shaft, it will be seen from Fig. 5 that $\frac{p}{p+r} = \sin x$, which is half the angle subtended by each ball. If 12 balls are to be used and no allowance for any play in circuit made $2x = 30$ degrees, and consequently $\sin x = \sin 15$ degrees = 0.2588. If the balls are $\frac{1}{2}$ in. in diameter, $p = 0.25$ in., and r has the value 0.716. The value of a is given by the equation $a = r + 2p$, and in the present case $a = 1.216$. From these results it can be readily seen that for a given bearing, in which there is

absolutely no allowance for radial or circumferential play, there is no permissible variation in any of the quantities a , r and p . For such bearings it is important that all the balls shall be perfect spheres of the same size. Even if an allowance is made for circumferential play, the equation $a = r + 2p$ still holds, and this demands the same accuracy as to sphericity and matching of the balls. Lastly, if radial play be allowed, the same demands are still to be made, as otherwise there will be great inequalities in the loads delivered to the balls actually carrying the stress at any one instant. Thus balls that are practically perfect in sphericity and uniform as to size are real and tangible necessities in a bearing designed for exacting service.

Gauging the Balls

The balls are not considered perfect when taken from the grinding machines even though they have been measured by micrometers there. They are next put through a process termed gauging, which divides balls that have come from the grinding machines of the same rated size into lots that differ from each other by 0.0005 in. or 0.00025 in. or less. The machine employed is illustrated in Fig. 6.

The balls are placed in a reservoir at the top from which they roll down a number of inclines. These inclines are formed by bringing into close proximity two straight edges which are not parallel but diverge slightly. Beneath the slit are arranged a number of receptacles corresponding to various slight deviations in size of the slit, so that a ball rolling down will drop into the compartment corresponding to its actual size. This is a simple and effective means of gauging. Fig. 7 shows one of these slits where the angle of divergence is represented by $2a$, m is any selected diameter and y the variation in size, according to which it is desired to sort the balls. From the diagram $y = 2x \tan a$, which holds for any value of x . If $x = 1$ in. and the allowable deviation is 0.00025 in., $0.00025 = 2 \tan a$, and a may be obtained from a table of natural tangents. It is simpler to control the slit by micrometer screws set perpendicular to the line bisecting the angle $2a$. If these screws are 10 in. apart, and it is desired to gauge the balls to 0.00025 in. at every inch of the slit, these screws are adjusted so that the one separates the straight edges 0.0025 in. further than the other. The simplest way of accomplishing a suitable arrangement of the micrometer screws is to have them threaded to the right at one end and to the left at the other, which has the effect of displacing both straight edges simultaneously.

Even after balls have been gauged inaccuracies persist, as at the moment a ball dropped through the slit into the compartment below it was but a single diameter which decided the question as to whether the ball should drop or roll on. Among all the diameters presented to the edges of the slit preceding the moment of the drop none was as small as the slit at the instant it rolled by. Consequently, it is not possible to determine the question of sphericity, which is a matter of great importance.

To test for this the Standard Roller Bearing Company employs a plate of glass suitably framed and of a size convenient for a girl to handle. Beneath this glass is a sheet of green material to reduce the eye strain. The balls to be tested are placed upon the plate, and the girl tips it back and forth causing the balls to roll about on the plane surface of the glass. A ball which is "out-of-round" will sooner or later disclose itself by irregularities in its rolling, and a girl trained and adapted to this work will readily discover its presence and remove it by a small rod of magnetized metal.

This is not the only process through which the finished and gauged ball has to pass. It may be imperfect because of uneven hardening or pitted places. A sharp-eyed girl, trained to the variations in color shown by an unevenly hardened ball and to other im-

perfections visible to the eye, is able to accomplish good results in a moderate time. To do this it is necessary to see all sides of the ball under favorable conditions of convenience and light. This is accomplished by placing the balls upon a second glass plate similar to the first, but they are kept comparatively quiescent. A piece of stiff material is inserted underneath the balls from the front, the girl and the whole arrangement facing the light. Moving this sheet back and forth turns the balls about without necessarily displacing them. This is necessary as in the case of a ball rolling about the plate of glass, it would be difficult to compare different parts of its surface.

Tests for Strength

An important matter connected with balls and ball bearings is the question of the duty which a ball of given size may be reasonably expected to perform. This is a most complicated matter, as in journal bearings where the load comes upon but one part of the circuit of balls at a given instant, the operation of the bearing is accomplished by having the races out of center with each other and the load falls upon but few balls at any one instant. This question has already been discussed in two articles published in *The Iron Age*, October 17 and 24, 1907. The one or two balls nearest the line joining the centers of the load and the bearing are subjected to an excessively disproportionate share, and it would almost appear necessary to use balls of a size and strength, such that a single ball is capable of withstanding the entire strain. In the case of balls used where the service is not very exacting, this matter may be largely neglected, but when the question concerns a bearing subjected to heavy loads, shocks and jars and high speeds, the ability of the ball is a matter of great importance and one which must secure at least an approximate solution.

This company makes use of the testing machine shown in Fig. 8. The ball to be tested is placed between two plates, the lower of which rests on a carriage connected with the heavy lower beam. The upper plate is controlled by two screws, one of which may be seen in the engraving. These screws are operated by power and draw the upper plate down. The ball is tested until it fails.

As an example of the loads necessary to crush good balls, certain results with $\frac{3}{4}$ in. and $\frac{1}{2}$ in. balls may be cited. With the $\frac{3}{4}$ -in. ordinary tool steel ball, the limit is about 58,000 or 59,000 lb., but with Standard alloy the limit of resistance increases to 96,000 lb. In the case of a $\frac{1}{2}$ -in. ball made of high carbon steel, but not an alloy, 25,000 lb. has been found sufficient to crush it. If, the special alloy, it is necessary to use 50,000 to 60,000 lb. pressure.

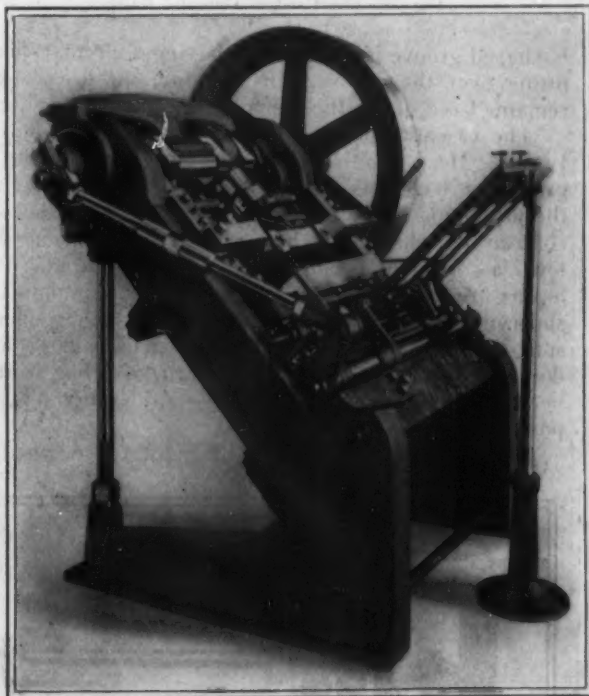
Aside from the material of which they are composed, balls are graded in quality. These grades are the results of the tests for sphericity and for uneven hardness, pitting and the like.

Railroad Equipment Orders.—The St. Louis & San Francisco has ordered from the American Car & Foundry Company 500 box cars, in addition to 500 stock cars and 250 tank cars recently placed. The report that the Chicago & Alton is in the market for 3000 cars is merely the revival of a portion of the Hawley lines inquiry reported some weeks ago. The Maine Central has been considering the purchase of 1500 cars. The American Locomotive Company has booked 10 engines for the Maine Central, 5 for the Chicago Southern, 10 for the Terminal Railroad Association of St. Louis and 5 Mallet locomotives for the Baltimore & Ohio, which has 25 more under inquiry. The Illinois Central order for 35 consolidation locomotives was placed with the Baldwin Locomotive Works. The Canadian Pacific will build 5 Mallet locomotives. The Michigan Central has ordered 21 locomotives from the Montreal Locomotive Works.

The Walsh Double Crank Power Press

The Walsh Press & Die Company, 4709 West Kinzie street, Chicago, Ill., has recently designed and brought out a special double crank power press fitted with gang dies and automatic feed for the production of drawn shells similar in size to the cover of an 8-oz. baking powder can. The approximate dimensions of these shells are $2\frac{1}{8}$ in. in diameter, with a drawn edge of $\frac{3}{8}$ in. The gang of dies, which numbers eight, cuts 80 of these blanks from a standard sheet of tin 20 x 28 in., draws them and embosses or letters the covers in one operation.

The press proper is swung by trunnions from its legs and is supported in the rear by heavy vertical jack-screws, which can be adjusted to incline the press to the most convenient angle to suit the requirements of the work to be done. The front feeding mechanism is arranged so that it places the sheet automatically in the feed proper. All that the operator has to do is to put



Double Crank Power Press for Rapid Production of Drawn Shells, Built by the Walsh Press & Die Company, Chicago, Ill.

the sheet in place, and while this mechanism is automatically placing it in the feed, ample time is given for adjusting another sheet in place, thus making the production of these shells a continuous operation.

The press is run at a speed of 90 strokes per minute, and as the dies produce eight covers at each stroke, the theoretical output for a 10-hour day of continuous running is 432,000 finished shells or covers. Allowing for reasonable stoppages, the builder claims that from 250,000 to 300,000 covers can be made in this time or an equal number of shells of similar character can be produced.

The Wheeling Mold & Foundry Company, Wheeling, W. Va., at a meeting of stockholders held July 27, increased its capital stock from \$405,000 to \$500,000, for the purpose of more easily handling some large contracts recently taken. It is to furnish the steel, iron and bronze castings and machine work on them, amounting to about \$900,000, for the Panama Canal, for which the McClintic-Marshall Construction Company, Pittsburgh, took the general contract for lock gates, &c. This work, with other orders on hand, will enable the Wheeling Mold & Foundry Company to operate its plant to capacity for a considerable period.

A Notable Motor-Driven Plant

Thorough Wiring Construction and Extensive Use of Chain Drive Are Special Features

The maximum of cleanliness and the economy of space which the electric motor drive affords is perhaps nowhere more apparent than in the plant of the Improved Seamless Wire Company, Providence, R. I. Adopting an effective combination of the group and the individual drive in the layout of the motors has resulted in extreme economy both as regards initial cost and operating expense. Figs. 1 and 2 show the motors driving reducing rolls through chains, and Fig. 3 illus-

trates the use of a back geared motor for driving a rotary shear. The use of the Morse silent chain in connection with the individual drive of the rolls is another feature worthy of mention. The use of the chains makes it possible to transmit power with a positive speed ratio between the shafts located very close together with practically noiseless operation and an efficiency of about 99 per cent.

The output of this plant is seamless gold wire and tubing, such as is used extensively in the manufacture of the cheaper grades of jewelry. Essentially the process consists of pressing a slab of gold upon a slab of copper, and reducing the plated metal thus formed to the proper thickness. This is then cut and drawn into

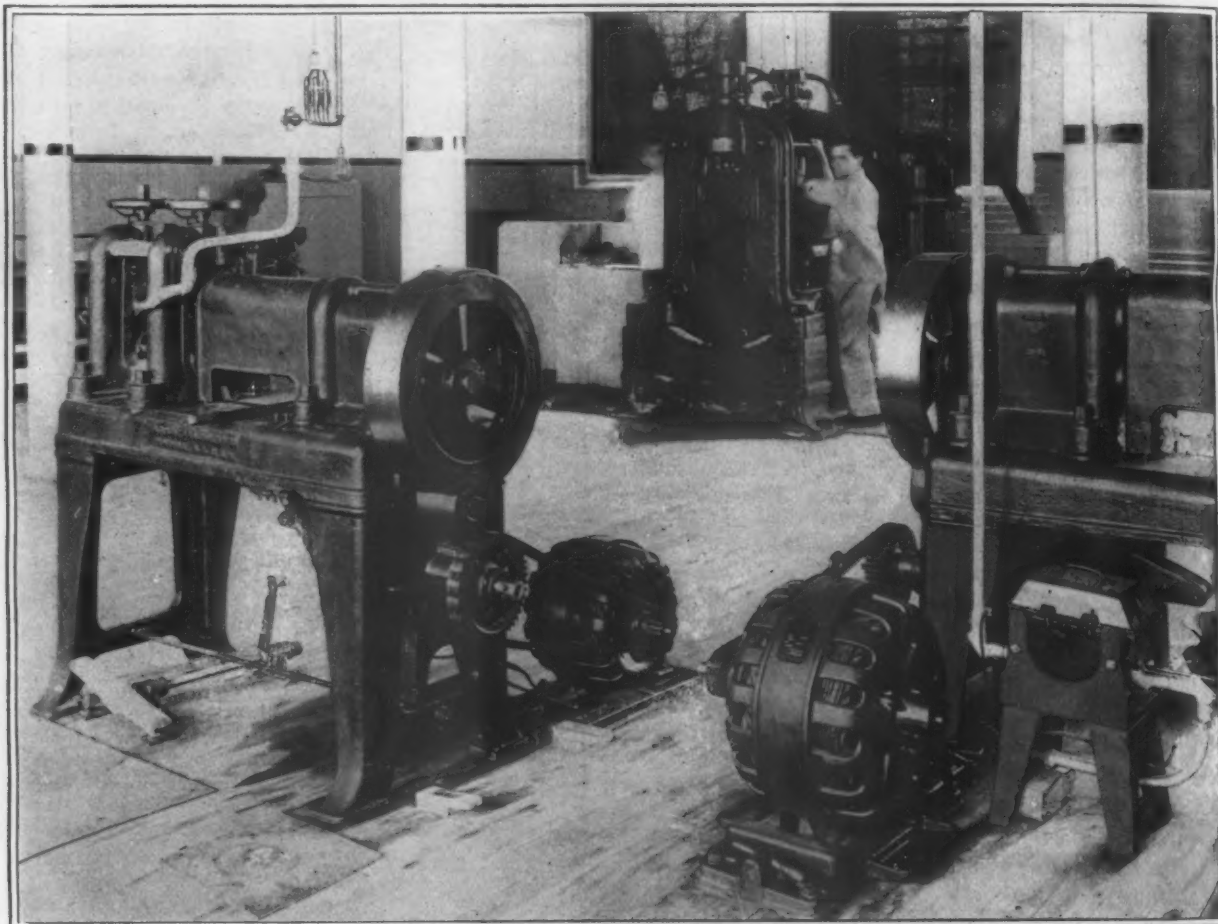


Fig. 1.—Motor Drive in the Improved Seamless Wire Company's Plant, Providence, R. I. Motors Driving Reducing Rolls Through Chains and Controlled by Auto-Starters Operated by Foot Treadles.

trates the use of a back geared motor for driving a rotary shear.

One of the features of the installation is the thoroughness with which the wiring was done and the illustrations are all typical views of the work. All of the wiring was run in conduit, and the fittings corresponding to it were used wherever a change in the direction was made. Auto starters have been used throughout the plant, and are mounted in the most convenient locations. Fig. 1 shows an interesting application of the starter where a foot treadle is used to operate it. As will be noticed the machine at the left shows very clearly the way in which the treadle operates the starter by turning the rod and the crank attached to the rear end thereof when the treadle is depressed. The motion of the crank is transmitted to the auto starter through a rod, the connection to the crank being shown in the machine at the left, and that to the auto starter by the machine at the right. In this way it is a very easy matter for the operator to start and stop the machine without any effort other than simply shifting the position of the treadle, so that one end is alternately raised and depressed. In Fig. 2 the auto

wire or tubing. After the slab is made it is taken to the rolling department where it is passed through the rolls shown in Figs. 1 and 2 and reduced to the proper thickness. From the reducing rolls the metal is taken to the rotary shear shown in Fig. 3, where it is cut into small squares. These small square sheets of metal next go to the press room where they are shaped into the form of a cup. These cups are elongated by different sets of dies until they resemble a very short section of heavy copper tubing.

Further procedure depends entirely what use is to be made of the material. If tubing is to be made the cups are taken to the swedging machines where they are still further reduced and are finally turned into the form of seamless gold plated tubing on the draw benches. If, on the other hand, it is desired to make wire the material is taken first to smaller swedging machines, then to a set of reducing rolls, and finally to the coiling machines when it is ready for shipment.

The electrical equipment of the plant includes 20 type CCL motors, built by the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa. These vary in capacity from $\frac{1}{2}$ to 30 hp., and the total horsepower is

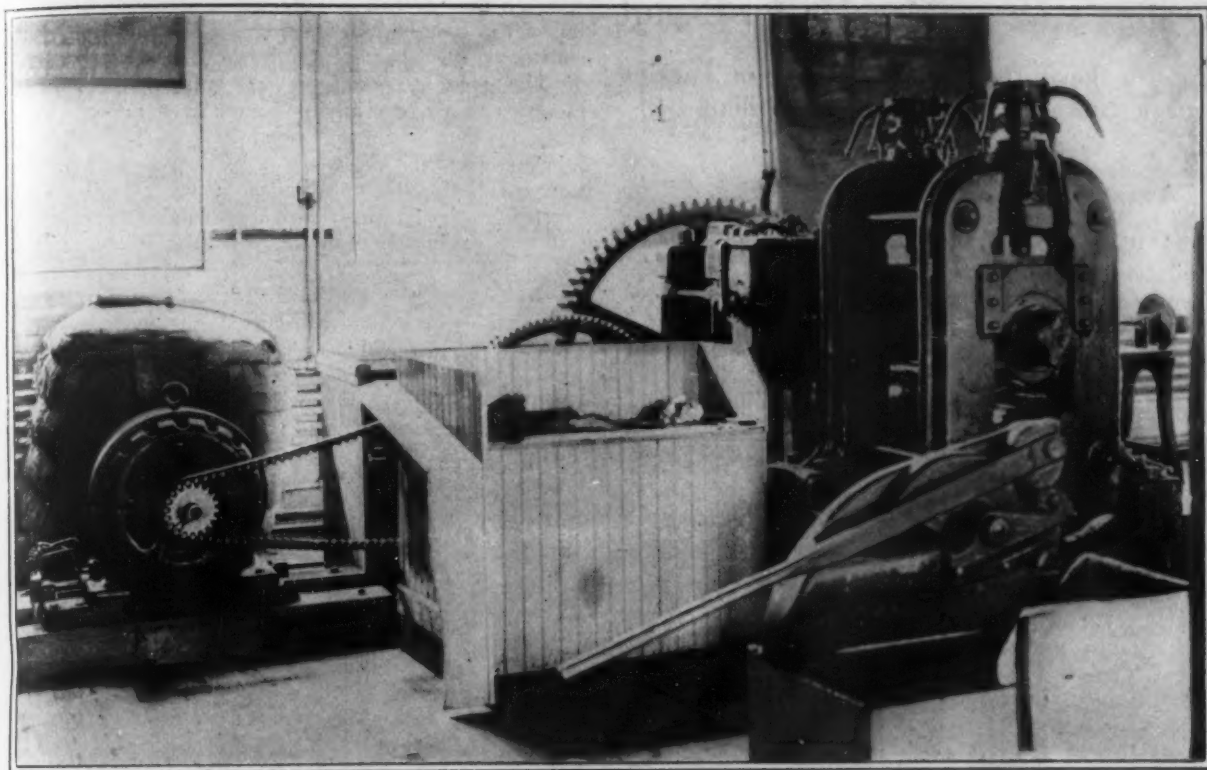


Fig. 2.—15-Hp. Westinghouse Motor Driving Reducing Rolls.

113. These motors operate on a 550-volt, three-phase, 60-cycle circuit, the current being supplied by the local electric light company.

A Novel Sheet Metal Exhibit

A notable exhibit at the sixth annual convention of the Master Sheet Metal Workers' Association, now being held in Philadelphia, is that of the Stark Rolling Mill Company, Canton, Ohio, manufacturer of the well-known Toncan metal roofing, siding, troughing, &c. For some years, prior to the introduction of its Toncan metal, the Stark company labored hard on the problem of producing a moderate priced sheet metal that, while possessing the best points of high grade charcoal iron, should resist corrosion to a much greater degree, and consequently prove more durable. That their labor was

not in vain is fully realized by all metal workers familiar with the merits of Toncan metal, while to those who are not so familiar the display at the Philadelphia convention is submitted as proof.

In striking contrast to the brilliance with which it is surrounded, the glint and glitter of countless electric lights reflected from myriads of polished surfaces, the Stark company's exhibit stands dark and mournful—melancholy testimony to the insufficiency for its purpose of the material from which it is constructed. For it is, in fact, nothing less than a section of ordinary metal sheeting removed bodily from a building that for years has been exposed to the onslaughts of the elements, but which it has unsuccessfully endeavored to resist. The section removed consists of siding, roofing and eaves trough literally eaten away by rust, caused by the action of the moisture laden atmosphere. Above the entrance to this relic of a once perfect building swings the double diamond design—the sign of Toncan metal and an invitation to enter. Within all is brightness—another strong contrast to the dull exterior, but a suitable setting for the display of Toncan metal to be seen there. Prominent in this display is a demonstration of the behavior of Toncan under severe acid tests, representing as nearly as possible the conditions with which sheet metal work has to contend during years of exposure to the elements. The unique menu to be used at the banquet given by the Stark company will be printed upon real sheets of Toncan metal. The exhibit is in charge of Mr. Remsen and other representatives of the Stark Rolling Mill Company.

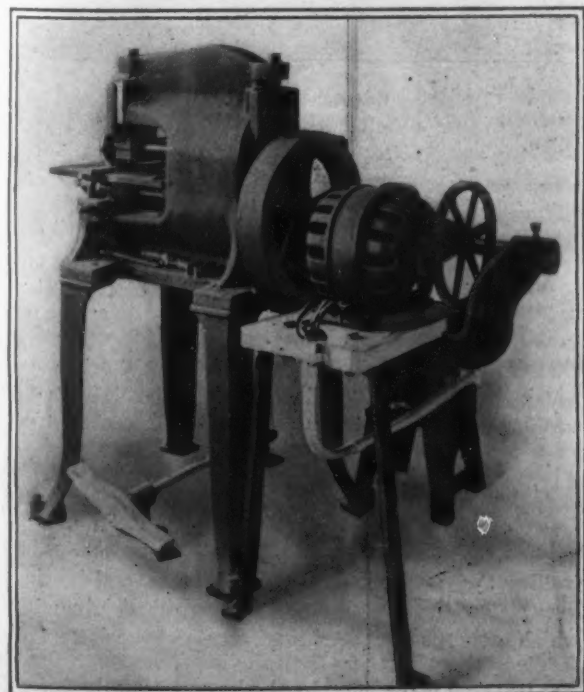


Fig. 3.—Back Geared Motor Driving Rotary Shear.

The Westinghouse Electric & Mfg. Company secured last week from other Westinghouse companies their share in the stock of the Interworks Railroad, which connects the East Pittsburgh shops with the Trafford City plants of those interests. The road is 7 miles long, and not only can steam power be used on it to advantage, and is used to some extent, but it also can be operated by the third-rail, the single phase, the alternating current and the direct current trolley systems. The main purpose of the line is to enable the Westinghouse companies, which include the Electric, Machine, Air Brake and Foundry, to transfer materials from one plant to another.

Crating a Large Machine for Export

Constructional Details and Method of Packing a Newton Portable Boring, Drilling and Milling Machine

A new design of the No. 1 portable boring, drilling and milling machine built by the Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa., for which there is a large demand from electrical manufacturing plants, is illustrated herewith. The use of this machine curtails the continuous use of the heavy cranes required to handle the massive castings of generator frames, and on smaller

through the vertical driving worm spline shaft, which has a top and bottom bearing. This vertical driving shaft also carries a separate worm to transmit feed.

The spindle, which is $4\frac{1}{4}$ in. in diameter, is mounted in a sleeve having double keys, and the sleeve is driven by a worm and worm wheel. The latter has a bronze ring and the worm is of hardened steel. Motion for the 30-in. continuous power geared feed is carried by the shaft B, which is coupled at C to permit of engaging short or long spindles and necessarily long or short horns and driving shafts to meet the requirements of the particular diameters operated on. The hand wheel D controls the engagement of the spindle feeds, of which there are three, and the wheel E controls the fast traverse of the spindle. The maxi-

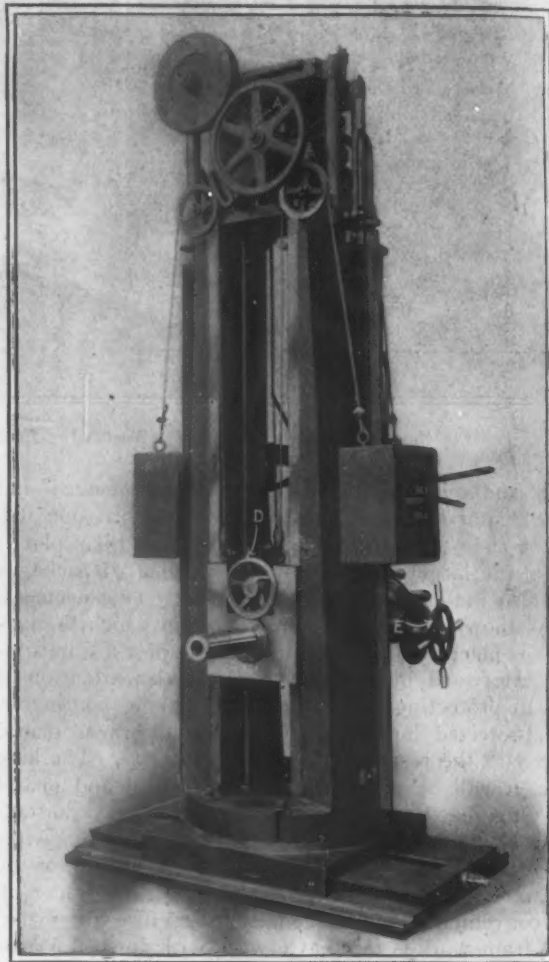
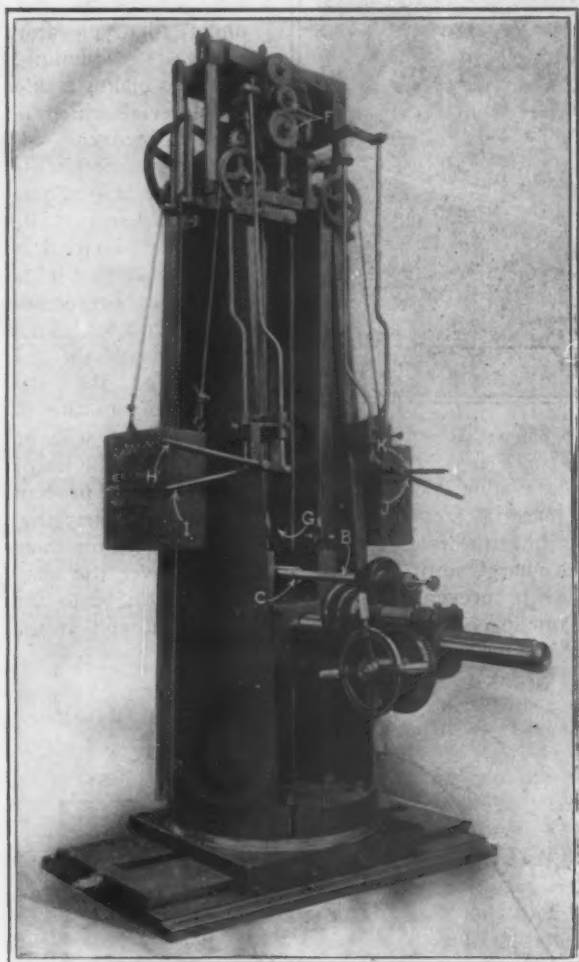


Fig. 1.—Operating Side.

Fig. 2.—Working Side.

Two Views of the No. 1 Portable Boring, Drilling and Milling Machine, Built by the Newton Machine Tool Works, Inc., Philadelphia, Pa.

work economy is also secured through its use, as numerous operations, such as slotting, milling, drilling, tapping, boring and keyseating can be performed with one setting of the work, which effects a saving in the time of production. Figs. 1 and 2 show the operating and driving sides of the tool, and Fig. 3 illustrates the construction of the case in which one of them was recently shipped abroad. The particular advantages of this type of machine are the great rigidity due to mounting the spindle saddle between the uprights and the convenient arrangement for detaching the base plate, which measures 74 x 42 in., to permit of lowering the machine through small diameter frames, a necessity which the machine is particularly designed to meet.

Motion is transmitted from a 5-hp. motor operating at speeds ranging from 300 to 1400 rev. per min. through rawhide pinions to the horizontal driving shaft A, on which the double train of bevel driving gears giving reverse to the drive is mounted, and, further,

num and minimum distances between the spindle center and the floor plate are 22 and 82 in. respectively.

The spindle saddle has square lock gibbed bearings to the upright and adjustments are made by taper shoes. The saddle is counterweighted and has reversing vertical traverse and two changes of feed for each of the change gear combination which are attached at F. The studs holding these gears are fitted with hairpin washers and small nuts to allow easy removal of the gears without taking off the nuts.

Motion for the feed is taken from the driving shaft at G for the fast vertical traverse and feeds, the difference in rate being obtained by single and triple lead worm wheels. The lever H operates the clutch controlling the direction of spindle rotation, and the lever I actuates the clutch on the vertical driving shaft which governs the elevating or the lowering of the saddle without rotating the spindle. The clutch for the fast traverse is operated by the lever J, and the lever K controls the engagement of the two-to-one feed gears

with which the machine is fitted. The upright has a hand adjustment of 30 in. on the base.

Fig. 3 is a reproduction of a photograph of one of these machines boxed for shipment to Sweden. All

discharging would fall into this vacant space under the buckets in front of it. When the buckets and belt came together again after leaving the pulley, the result was that the bolts would pull out of the belt and in

short time the elevator was ruined. Another trouble was that some of the material would spill sideways from the buckets as they passed over the head pulley. This is clearly shown in the engraving, and not only makes it dangerous for persons to pass under the elevator while it is running, but also makes a pile of material which is hard to recover.

The Stephens-Adamson Mfg. Company, Aurora, Ill., has developed a bucket, which, it is stated, overcomes these troubles, and also adds to the capacity of the elevator. From the illustration it will be seen that the sides of



Fig. 3.—Framework of the Case in Which the Machine Was Shipped Abroad.

small and overhanging parts are first removed and those requiring extra protection from corrosion are packed in a small sealed box, which is then placed within the larger one to limit the number of packages and also the liability of delay through misplacement.

As shown, a cradle is constructed in which the machine is placed and a protecting frame of 3 x 6 in. timbers afterward built around. Particular attention is paid to protecting the corners and having continuous well protected longitudinal and lateral braces placed exactly in the respective centers of gravity. The base plate, it will be noted, has been removed and placed above the machine. This method gives a very substantial package with all possible crevices utilized. After completion any side could be used for the bottom of the box were it not for the fact of placing skids under all for convenience should conditions require their use. This framework is faced afterward with finished boards to permit of clear markings.

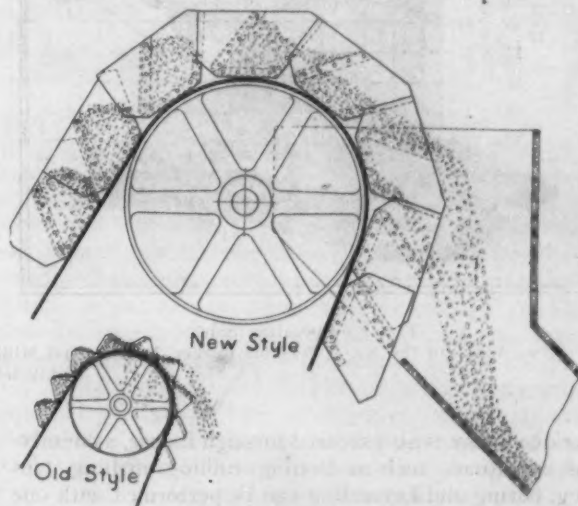
The timber used in this particular crate weighs 2500 lb., and the crate is 12 ft. long by 6 ft. high by 4 ft. 5 in. wide. The total weight of the crate and machine is 16,500 lb., and the tool alone weighs 14,000 lb. The cubic contents of the case is 225 cu. ft.

A New Bucket Elevator

Continuous bucket elevators are those where the buckets are placed as close together as possible. This arrangement possesses the following advantages: The material may be fed directly into the buckets without striking the belt and wearing it out, the elevator requires no boot and a greatly increased capacity is secured.

The buckets on any belt elevator are necessarily fastened to the belt on a line running across it, so that when passing over the head pulley the belt does not tear away from them. The bottom of the buckets then in passing over the pulley becomes tangent to it at the point of fastening, and this leaves a space between the ends of the buckets and the belt. Heretofore the great trouble with continuous elevators, it is claimed, has been that some of the material from each bucket when

the new style buckets overlap at all times and prevent the material from spilling sideways when discharging. The lip at the front also renders it impossible for them to discharge until they are far enough over the head pulley to prevent the contents from falling into the vacant space under the preceding bucket, and at the



S.-A. Continuous Side Lapping Bucket, Made by the Stephens-Adamson Mfg. Company, Aurora, Ill.

same time increases the capacity because of the elimination of the objectionable features of the older type of conveyor.

The Eagle Brass Works, Chattanooga, Tenn., has been sold by Mrs. Marcia E. Moffett, administratrix for the estate of William Moffett, to H. L. Hiebeck and C. L. Martin, who will operate the plant under the firm name of Hiebeck & Martin. The Eagle Brass Works is one of the substantial interests of Chattanooga, having been established a quarter of a century ago by Mr. Moffett. The new owners have for a number of years been associated with the Walsh & Weidner Boiler Works of the same city.

Condensers for Small Central Stations*

The Effect of Vacuum on Steam Consumption and Recent Efforts Made to Increase It

BY CHAS. S. LEWIS.†

It is the purpose of this paper to set forth the effect of vacuum on the steam consumption of various types of prime movers, to discuss briefly the elementary facts of condensation and to describe some recent improvements in condensing apparatus and their effect in securing higher vacuums at less cost.

Fuel Saving

The maximum efficiency possible for any heat engine is determined by dividing the difference between the absolute temperature at which working fluid is received and the temperature of rejection by the first, from which it is evident that any lowering of the second greatly improves the efficiency of the heat motor. The curves of Fig. 1 show graphically the theoretical increase in efficiency due to such reduction. It is seen that the higher the vacuum, the greater is the increase in the efficiency of an ideal engine for each inch increase of vacuum. Thus, while at 20-in. vacuum an increase to 21 in. adds only 3 per cent. to the efficiency, the increase resulting from increasing the vacuum from 28 to 29 in. is 15 per cent. A glance at a steam table

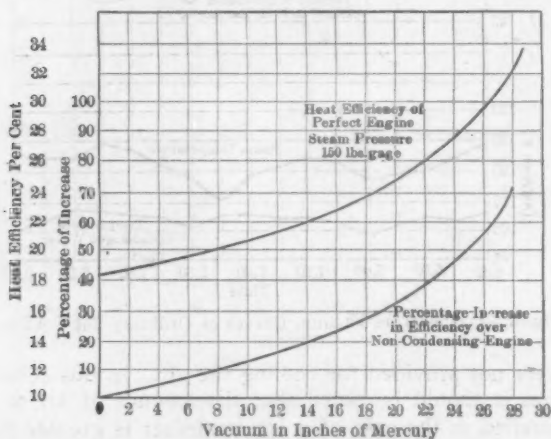


Fig. 1.—Efficiency Curve of the Perfect Engine.

will at once explain this, for while the drop in temperature of saturated steam from 20 to 21 in. vacuum is only 5 degrees F., the drop from 28 to 29 in. is 22 degrees F.; from another point of view, the pressure multiplied by the increase in volume of a pound of steam from 20 to 21 in. is 286 ft.-lb., while from 28 to 29 in. it is 1137 ft.-lb. In the above, and throughout this paper, unless otherwise stated, reference is made to a 30-in. barometer; that is, a 28-in. vacuum means an absolute vapor pressure of 2 in. of mercury.

Certain types of prime movers are more capable of utilizing low back pressures than others. All heat engines using steam can be divided into reciprocating engines and steam turbines, the former in turn being subdivided according to the speed, the number and type of valves and the number of cylinders. The economy to be derived from running any of these various engines condensing will in general depend upon the steam saving in each case, the value of the steam and the cost of the vacuum. The simple slide valve engine, subject to great losses due to wire drawing in the valve, large clearance spaces and considerable cylinder condensation, usually consumes from 30 to 50 lb. steam per brake horsepower when running noncondensing, depending upon the type of governor and the load. Even this

engine, ill adapted as it is to derive benefits from reduced back pressure, shows considerable improvement. Fig. 2, taken from a test made by Prof. R. C. Carpenter on a small slide valve engine, shows how the use of

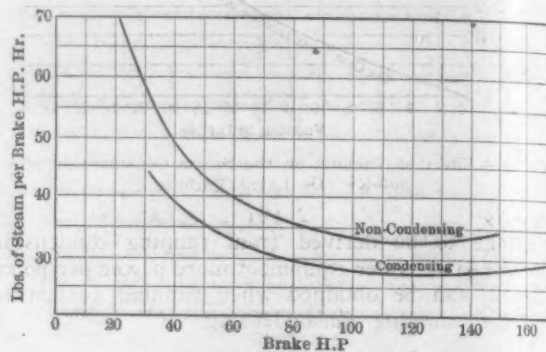


Fig. 2.—Effect of Vacuum on the Steam Consumption of a Simple Slide Valve Engine.

vacuum increases the steam economy of such an engine.

The single expansion, slow speed, four-valve engine is more efficient and, roughly speaking, the steam consumption is reduced 25 per cent. by the condenser. The compound engine with Corliss valves is of more general importance, and the economy of using condensers is considerably greater. This is because the exhaust valves open more widely, there is less range of temperature and hence less condensation in each cylinder, and also because the ratio of expansion can be made greater. The steam per horsepower decreases with the increasing size of engine. Likewise, the economy derived from condensing apparatus increases as the engine size increases.

Owing to the greater ratio of expansion and the fact that there is no alternate heating and cooling of metal surfaces to cause condensation within the turbine, this type of heat motor derives the greatest benefit from condensing apparatus. In the turbine the steam is allowed to expand completely to condenser pressure while doing work. The increase in economy of a 300-kw. Parsons turbine with increase in vacuum is shown by Fig. 3. The total per cent. increase in economy amounts to 40 per cent., corresponding to a reduction in steam consumption from 34.1 to 21.1 lb. per kilowatt hour. Fig. 4 shows the effect of vacuum upon the steam consumption of a De Laval turbine of 300-kw. capacity operating at full load with saturated steam at 150-lb. gauge.

The lessened steam consumption due to operating under reduced back pressure is not the only important

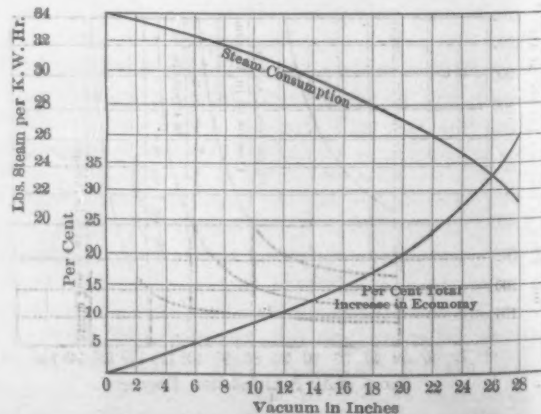


Fig. 3.—Effect of Vacuum on the Steam Consumption of a 300-Kw. Parsons Turbine.

* Presented at the annual convention of the Missouri Electric, Gas, Street Railway and Waterworks Association, Jefferson City, Mo., April 16, 1910.

† Wheeler Condenser & Engineering Company, Cartaret, N. J.

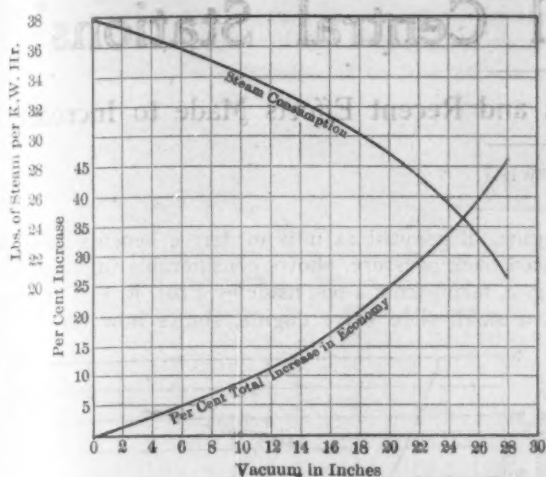


Fig. 4.—Effect of Vacuum on the Steam Consumption of a 300-Kw. De Laval Turbine.

advantage to be derived from running condensing. With the same boiler equipment more power per pound of steam can be obtained when running condensing than when running noncondensing.

Principles of Condensation

A pound of steam at a pressure of $1\frac{1}{2}$ in. absolute, corresponding practically to 3 in. of mercury or 27 in. vacuum, referred to a 30-in. barometer, will occupy a volume of 231.8 cu. ft., and have a temperature of 115 degrees F. If the steam is saturated the temperature will remain the same so long as the pressure remains unchanged. If this pressure is maintained within a condenser that is receiving steam constantly a volume of steam must be condensed during each minute equal to the rate of inflow. Otherwise the pressure and temperature of the steam within the condenser will be raised by compression.

The temperature at which cooling or circulating water is received is usually fixed by the conditions and surroundings of the power plant. The temperature to which the water can be raised is limited by the temperature of the steam, and a perfect condenser would heat the circulating water to this temperature, and would require the theoretically minimum amount. Practically, however, there must be some difference in temperature between the steam and the water in order that the heat may flow from the steam to the water, as through the metal tubes of a surface condenser. In a jet condenser, where the steam comes into immediate actual contact with the water, conditions are different, and if thorough intermixture is secured the temperature of the water may be brought very close indeed to that of the steam. Under the simple conditions above assumed, and assuming a perfect condenser, the vacuum is determined solely by the temperature and amount of cooling water available. A condenser based on these facts would consist then only of means of

circulating the cooling water, of bringing the steam and water together and of removing the water resulting from the condensation of the steam. In practice, however, the problem is much complicated by the entrance of another element—namely, air.

At the inlet opening there is a constant inflow of practically pure water vapor with only an almost negligible percentage of air. This vapor, upon striking the cold circulating water rapidly condenses, becoming richer in air until at the extreme farthest part of the condenser air constitutes an important part of the mixture. The water vapor and air in a cubic foot of the mixture at this point can be determined if the total pressure in the condenser and the temperature at this point is known. The relations between these quantities are shown graphically in Fig. 5. As will be seen, a high vacuum is impossible without a cold air pump suction and a hot air pump necessarily implies a low vacuum. The bearing of these facts upon condenser design will be brought out more fully later on.

Jet Condensers

Heretofore the great trouble with jet condensers has been that the steam was not brought into thorough intermixture with the water, and that efficient means

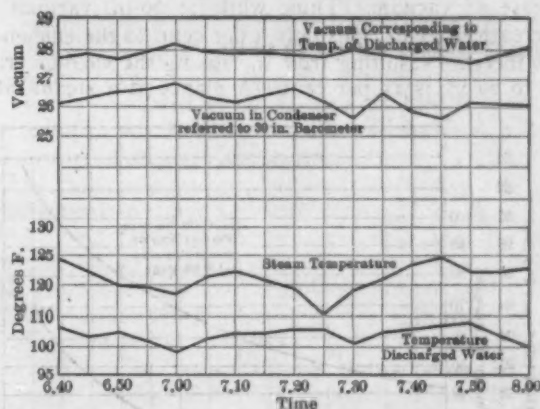


Fig. 6.—Temperature-Vacuum Curves of Ordinary Jet Condenser.

were not provided for cooling the air. In this connection it should be noted that the amount of air to be handled in the case of a jet condenser is greater than with a surface condenser, due to the air introduced in solution in the circulating water. This supplies an added incentive for keeping down the volume of the latter as much as possible. Fig. 6 is a graphical log of a test carried out recently in a railroad and lighting central station where a steam turbine exhausted into an old style jet condenser.

Turning now to a test carried on simultaneously in the same plant with another turbine exhausting into a Wheeler rectangular jet condenser which was illustrated and described in *The Iron Age* November 4, 1909, it will be seen that the vacuum is not only considerably higher, but that the temperature of the exhaust steam and of the discharged cooling water are almost identical. The results of this test are shown graphically in Fig. 7. The cooling capacity of the water has been used to the utmost extent, the very highest vacuum being obtained for the amount and temperature of the water available. The higher vacuum means a saving of about 5 per cent. in the steam consumption of the main turbine, and is obtained with less work on the part of the circulating pump.

A closer inspection of the diagram will show a rather startling condition. For instance, at the time 6.50, it is noticed that the temperature of the steam is about 2 degrees less than the temperature of the water, which is cooling it which is undoubtedly due to the lag of the thermometer. It is to be noticed, too, that the load on the machine was varying quite rapidly with sudden peaks. Nevertheless, soon after the load had

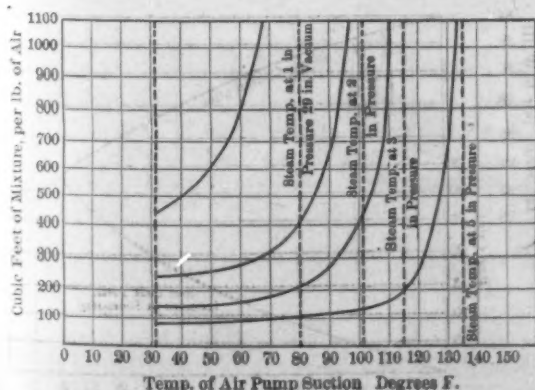


Fig. 5.—Volume of Mixture Per Pound of Air at Various Suction Temperatures and Total Condenser Pressures.

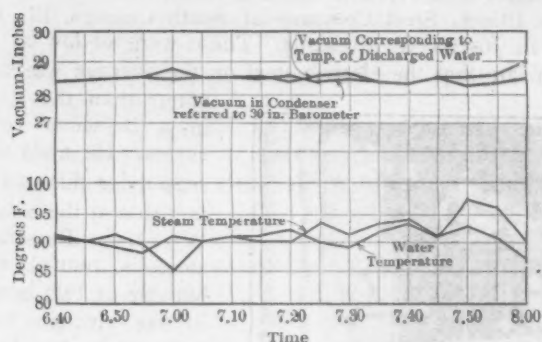


Fig. 7.—Temperature-Vacuum Curves of Wheeler Rectangular Jet Condenser.

increased the condenser was able to give a high vacuum regardless of the variation in load.

The curve of recorded vacuum and that corresponding to the temperature of the cooling water are practically identical, showing that for the water conditions the greatest possible vacuum is obtained.

The air pump used with the Wheeler rectangular jet condenser during this test is of the rotative dry vacuum type. As shown in the cross section in Fig. 8 this pump is a single stage machine, but in addition to the ordinary poppet outlet valves is fitted with a positively moved, semi-rotative valve more or less similar to a Corliss valve and having a peculiar function. In the illustration the piston is shown at the end of its stroke. It will be seen that the rotative valve is in such a position that the two ends of the cylinder are momentarily in communication. By this means the pressure in the clearance, which just a moment before was somewhat greater than 14.7 lb., is immediately reduced to the pressure on the vacuum side of the piston, so that when the piston starts on its outward stroke it at once draws in air from the condenser. The efficiency of this device is most clearly shown by the indicator card in Fig. 9. Instead of an adiabatic expansion of gases within the clearance space there is a straight drop in pressure, and as the stroke begins air is immediately drawn into the cylinder.

Surface Condensers

Improvements have been made in the surface condenser which are equally valuable in increasing the economy of the prime mover without adding greatly to the expense of auxiliary apparatus. While here no trouble is created by the introduction of large quan-

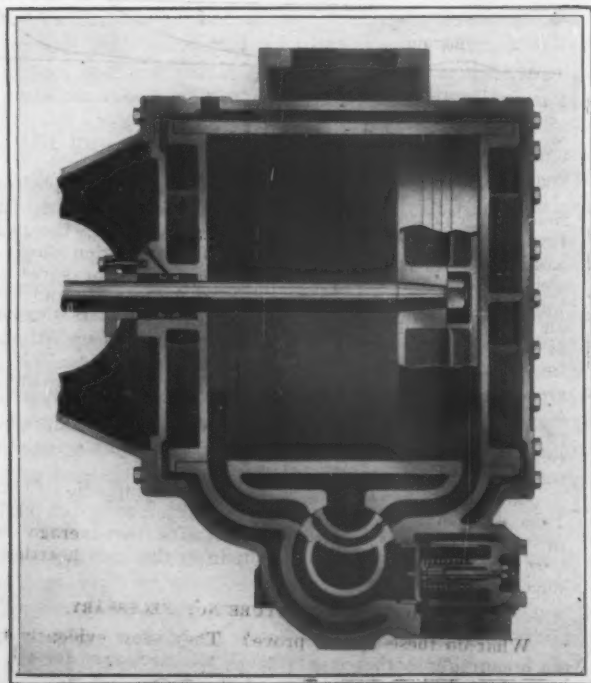


Fig. 8.—Cross Section of Cylinder of Air Pump Used With Wheeler Rectangular Jet Condenser.

ties of air with the injection water, there are other difficulties due to the fact that heat must be transmitted through metallic tubes. Investigations have shown that transmission of heat through condenser tube surface is affected by factors, among which the two most important are the conditions existing with regard to air and water. The presence of air in a condenser shell is inevitable and has a great effect upon the vacuum obtained. The lower portion of a surface condenser will contain the mixture richest in air, due both to the fact that the mixture is heavier than pure water vapor at the same temperature and to the effect of the incoming steam in driving the mixture down ahead of it. The air pump suction should, therefore, be placed in the lower part of the condenser shell. Air has a very low thermal conductivity. Hence, if the tubes of a condenser are surrounded by air they will not be as effectual in abstracting heat from the steam as they would if less air were present, and the air pump capacity should be sufficient to prevent "air drowning" of the tubes.

It has been found by experiment that the greater part of the steam entering an ordinary surface condenser is condensed by the upper rows of tubes, and that the condensate falls down over the lower tubes in

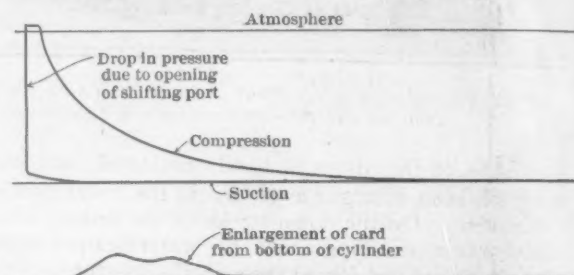


Fig. 9.—Indicator Card from Wheeler Rotative Dry Vacuum Pump.

a veritable flood. This is highly detrimental as it blankets the tubes, preventing steam from coming into contact with them and also because heat is uselessly abstracted from the condensed steam by the cooling water. Thus the cooling capacity of the circulating water is uselessly wasted. A condenser so constructed as to obviate these troubles of tube flooding is shown in Fig. 10. This condenser was supplied by the Wheeler Condenser & Engineering Company, Cartaret, N. J., to the Bronx Gas & Electric Company, Westchester, N. Y. A noticeable point about this condenser is the small amount of tube surface required. It was originally designed to condense 15,000 lb. of steam with circulating water at 70 degrees F. and to give a vacuum of 28 in. referred to 30-in. barometer with 2305 sq. ft. of cooling surface. By rearranging the unit on the dry tube system it was possible to omit 305 tubes, leaving only 1101 tubes in the condenser, a reduction in surface of almost one-fourth without giving in any way poorer vacuums. An illustrated description of the Wheeler dry tube condenser was printed in *The Iron Age* October 7, 1909.

The air pump used with this condenser, which can be seen at the right of the engraving, is of the Edwards type, where both air and water of condensation are handled by one cylinder.

A cross section of the pump is shown in Fig. 11. It is noticeable that there is only one set of valves in this pump, namely, the discharge valves. Water enters the cylinder of the pump by gravity from the hot well of the condenser, and on the down-stroke of the cone shaped piston is splashed through the ports in the cylinder wall up into the top of the cylinder. This process partially compresses the air already above the cylinder and also draws more air by inspiration from the condenser shell. The up-stroke of the piston immediately closes the ports in the cylinder wall and compresses the water vapor and air within the cylinder until the discharge valves are opened and the gases and water dis-

charged. An indicator card taken from this type of air pump is shown in Fig. 12. This is a combined card taken from the upper and the lower sides of the piston. The card from the upper side consists of a long expansion and long compression stroke. The card from the

electric furnace. He refers at the outset to some temperature measurements made at the Heroult furnace of the Illinois Steel Company at South Chicago, Ill., by Prof. Joseph W. Richards. These were so low as to indicate that the electric steel on the average was not

hotter than the steel in a Bessemer converter. He finds the reason for this in the fact that at the South Works Bessemer steel is refined for but one or two hours in the electric furnace, only 200 kw.-hours per ton of steel being supplied, so that the steel is only of good average quality—0.4 C., 0.4 Mn., 0.03 S. and 0.03 P. Prof. Neumann gives details of temperature measurements he made in the case of a Nathusius furnace of 5½ tons capacity at Friedenshütte in Upper Silesia, which were of about the same range as those noted at South Chi-

cago. His statement and comment are as follows:

Converter steel was charged into the electric furnace and refined to a very soft steel containing 0.5 to 0.6 C and very small amounts of sulphur and phosphorus (0.003 to 0.02 S and 0.004 to 0.017 P). The treatment lasted for 3½ to 4½ hours and the energy consumption per ton of steel was 300 to 400 kw.-hours.

The converter metal when poured into the smaller ladle had still a temperature of 1450 to 1470 degrees C. When poured from the ladle into the electric furnace the temperature was 1435 to 1450 degrees C. The interior of the furnace (immediately after the pouring of the finished steel) had a temperature of 1535 to 1560 degrees C., the points of the electrodes, when being withdrawn, being at 1300 to 1350 degrees C. The temperature of the electric steel when poured was 1500 to 1520 degrees C. for a soft charge and 1558 degrees C. for a high silicon charge. In the latter case the

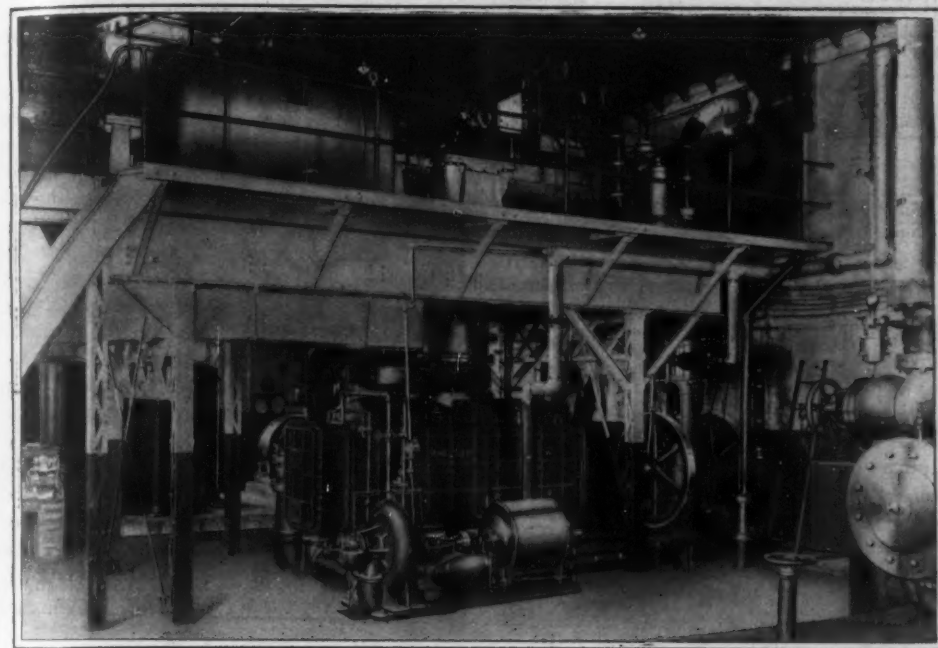


Fig. 10.—Installation in the Plant of the Bronx Gas & Electric Company of Wheeler Condensers, Built by the Wheeler Condenser & Engineering Company, Cartaret, N. J.

lower side of the piston is barely noticeable and has, therefore, been enlarged as shown in the lower part of the drawing. On the down-stroke of the piston, while rarification is occurring above, the water below the piston is displaced and forced through the apertures in the cylinder wall and thrown above the piston. The small amount of pressure exerted is shown by the little rise in the curve. During the up-stroke of the piston, water flows by gravity into the cylinder and there is no change in pressure, as indicated by the straight line in the card.

Temperatures of the Electric Steel Furnace

In a communication to *Metallurgical and Chemical Engineering* for August, Prof. Bernhard Neumann, Institute of Technology, Darmstadt, Germany, discusses the claims of high temperatures for steel refining in the

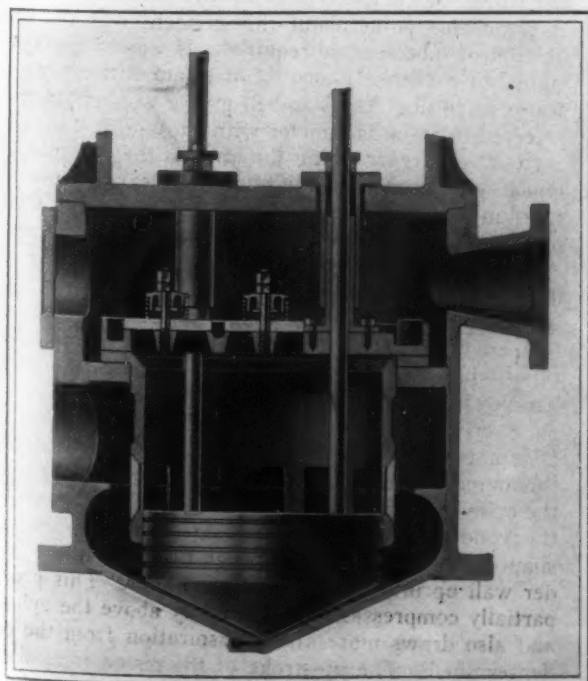


Fig. 11.—Cross Section of Cylinder of Edwards Wet Pump.

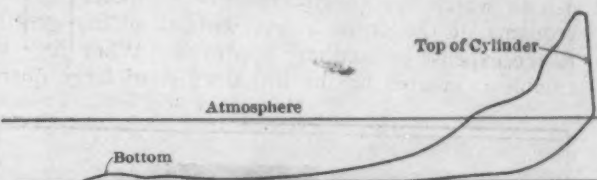


Fig. 12.—Indicator Card from Wheeler-Edwards Air Pump.

temperature when pouring into the ingot was still 1500 degrees C.

Since the electric furnace had always to wait a certain time for a charge of fresh Bessemer metal, the interior of the furnace cooled to about 1000 degrees C. After the metal had been charged into the furnace and the reaction was completed, the temperature of the slag layer was measured and was found to be after an hour, 1550 degrees C., and after an hour and a half, 1000 to 1650 degrees C. It remained at 1600 to 1650 degrees C. until the slag was removed, when its temperature was found to be between 1600 to 1560 degrees C. The removal of this first slag and the introduction of the dephosphorizing slag caused the bath to cool off somewhat to about 1550 degrees C., and the temperature remained in the second period of the treatment a little less than in the first period.

Concerning the Roehling-Rodenhauser induction furnace I have no numerical data of the temperature, but skilled open hearth furnace engineers estimate the average temperature not to be much higher than in the open hearth furnace.

VERY HIGH TEMPERATURE NOT NECESSARY.

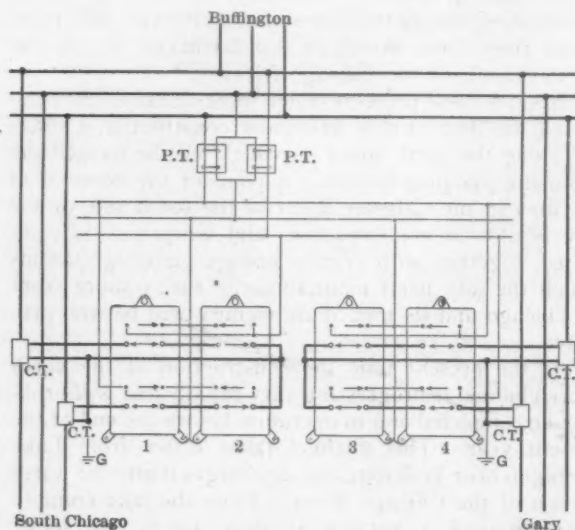
What do these figures prove? They show evidently that an abnormally high temperature is not necessary for the refining process. As a matter of fact, even the heat of the

arc for the local heating of the slag is not absolutely necessary, since it is generally known that the Roehling-Rodenhauser furnace permits the same far-reaching refining reactions to be carried out down to traces of sulphur and phosphorus without any arc. The refining possibilities of the electric steel furnace are, therefore, certainly due to a larger extent to the non-oxidizing atmosphere than to a very high temperature. There is no doubt that the possibility of producing a higher temperature in the electric furnace helps the refining process considerably, since the higher basic slag can be easily kept fluid, but, as mentioned above, the arc furnace is not absolutely necessary for this purpose.

On the other hand, it is quite self-evident that at the places right below the electrodes the temperatures are much higher than the above average temperatures. The proof of this is the formation of calcium carbide, which has often been observed in the arc furnace and which, according to the latest investigations, begins only at about 1820 degrees C., and which does not occur in the induction furnace. Further, the electric steel furnace offers the possibility of heating the metallic bath for special purposes to a much higher temperature than is possible in other furnaces. I have seen steel tapped at temperatures above 1650 degrees C., but on the average the mean temperature required for the almost complete removal of phosphorus and sulphur is not much higher than in other metallurgical furnaces.

The Metering of Electric Current at Gary and South Chicago

B. E. Semple contributes to the *General Electric Review* the following description of the interesting meter installation devised in view of the relation of the



Arrangement of Electric Meters for Gary and South Chicago Works.

electric power plants at the South Chicago Works of the Illinois Steel Company and the Gary Works of the Indiana Steel Company:

The Illinois Steel Company, South Chicago, Ill., generates its power at 2200 volts, three-phase, 25 cycles. The Indiana Steel Company, Gary, Ind., generates its power at 6600 volts, three-phase, 25 cycles. These two plants are about 16 miles apart and operate in parallel with each other through a 22,000-volt line, suitable step-up transformers being in use at each station.

The plant of the Universal Portland Company is located at Buffington, Ind., about 5 miles from Gary and 11 miles from South Chicago, and receives its power from the 22,000-volt line connecting South Chicago with Gary. At times Gary furnishes power to South Chicago and also to Buffington, and at other times to South Chicago alone or to Buffington alone. Likewise South Chicago at times furnishes power to Gary and Buffington, or to either separately.

This state of affairs demanded a system of metering whereby the proper billing amounts could be arrived at, and it was found that by using four three-phase, three-wire meters at the Buffington substation, connected as shown in the accompanying diagram, the

correct amount of energy consumed by the Buffington plant, coming either from South Chicago or Gary, could be recorded, as well as the amounts of energy passing from one generating station to the other. All four meters are equipped with ratchet devices so arranged as to move the recording hands only when the rotating elements are revolving in the proper direction, the meters being free to rotate in either direction, depending on the direction in which the current is flowing.

When South Chicago is feeding Gary and no energy is being used at Buffington, meters No. 1 and No. 3 are registering, since they are connected in series. When Gary is feeding South Chicago and no energy is being used at Buffington, meters No. 2 and No. 4 are registering, since they also are connected in series. When South Chicago is feeding Buffington alone, no energy being sent to Gary, meter No. 1 registers. When Gary is feeding Buffington alone, no energy being sent to South Chicago, meter No. 4 registers.

In billing, therefore, the amount shown by meter No. 1, less the amount shown by meter No. 3, is charged to Buffington, and credited to South Chicago; the amount shown by meter No. 2 is charged to South Chicago and credited to Gary; the amount shown by meter No. 3 is charged to Gary and credited to South Chicago; and the amount shown by meter No. 4, less the amount shown by meter No. 2, is charged to Buffington and credited to Gary.

The American Association of Commerce and Trade, Berlin, Germany

The above named organization, an American Chamber of Commerce founded seven years ago by Americans, is run by Americans on American lines for the purpose of promoting American trade with Germany and German trade with the United States. Its specialty is assisting American business firms to start branches in Germany. The organization has the largest and most complete reading room in the empire, receiving 30 daily American papers and 150 trade publications, all United States Government reports and statistics, all the directories of the leading American and German cities and the principal telegraph codes, all of which it places at the disposal of American business men and American travelers visiting Berlin. This association appeals to American business men intending to do business in Germany, whether temporary or permanent, as it can help them as no other institution or commercial agency can. Information is given regarding business conditions in Germany, agents are found, and inquiries answered thoroughly and satisfactorily. Its offices are in the Equitable Building, Friedrichstrasse 59-60, Berlin.

The Treadwell Construction Company, Midland, Pa., is building oil storage tanks for the Miami Copper Company, Miami, Ariz., one being 25 x 60 ft., and another 15 x 50 ft., and a flue for the Copper Queen Consolidated Mining Company, Douglass, Ariz., which is 13 ft. in diameter by 450 ft. long, the material being 5-16 in. thick and set on supports, with a total weight of 175 tons. It is installing a new 126-in. Hanna pneumatic gap riveter, having a capacity up to 1 1/4 in. Contracts on hand will enable the company to operate its plant to capacity for the next three months.

Ph. Bonvillain & E. Ronceray, 9 and 11 Rue des Envierges, Paris, who exhibited French molding machines in this country, having repurchased from the E. H. Mumford Company the patent rights for the Universal molding machines and pattern system, are now in a position to make arrangements with some American firm to handle this line of foundry equipment.

The Wilmette Pumping Station Equipment

Allis-Chalmers Pumps Furnished for Chicago Sanitary Works

The drainage canal for the sanitary district of Chicago and other incidental work performed in connection with it has attracted the attention of engineers for several years. The method employed to secure a pure water supply for a city of this size has been of chief importance. Prior to the beginning of this work the entire city discharged its sewage into the harbor directly or through the Chicago and Calumet rivers. This condition of sewage pollution resulted in severe epidemics of typhoid fever and Chicago had an unenviable reputation for this disease. Long and serious study of the existing conditions by both engineers and sanitarians led to the determination of the system finally adopted for remedying the trouble. This consisted in the construction of a canal about 28 miles long, connecting the Chicago with the Desplaines River at a point near Lockport, Ill. By this means the direction of the flow of the Chicago River was reversed, and the waters of Lake Michigan were used to dilute the sewage, which eventually finds its way to the Mississippi River.

Upon the completion of the canal, the work of providing other proper safeguards was carried forward. This included first the building of an intercepting sewer along the lake shore on the south side of the city, extending as far south as Eighty-seventh street and covering all that section included up to the Chicago River. At Thirty-ninth street a pumping station was built, which not only handled the sewage collected by the intercepting sewer but also took large quantities of water from Lake Michigan and discharged it with the sewage into the south branch of the river, thus tending to maintain a current which would keep it free from any dangerous or disagreeable condition.

This station contains four centrifugal pumps for handling the sewage and two screw pumps for taking the water from the lake, all of which were built by the Allis-Chalmers Company, Milwaukee, Wis. The plant has a total capacity of 2,100,000,000 gal. per 24-hour day, which is said to be the largest output of any single pumping station in the world. After this building was

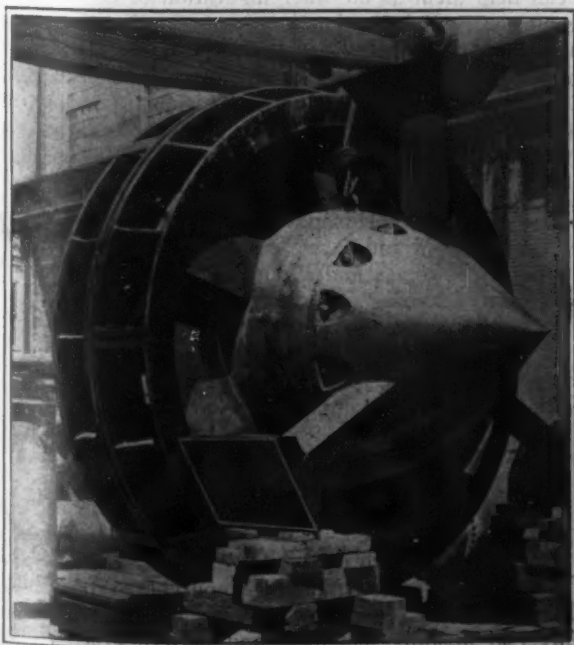


Fig. 1.—Suction Side of a Large Screw Pump, Built for the Chicago Sanitary District Pumping Station by the Allis-Chalmers Company, Milwaukee, Wis.

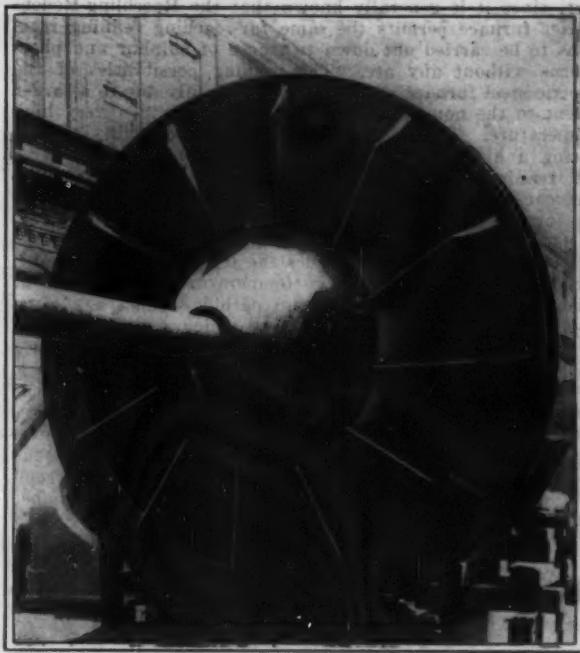


Fig. 2.—Discharge Side of One of Four Large Allis-Chalmers Screw Pumps.

finished work was begun on the Lawrence avenue station, which handles the sewage from the intercepting sewer along the north shore of the city and also takes water from Lake Michigan and discharges it into the north branch of the Chicago River.

Besides these projects which have already been completed, the district now has under construction a channel along the north shore on which will be located the Wilmette pumping station. A plan for the reversal of the flow in the Calumet River at the south side of the city is also in contemplation, and when this is completed, together with certain sewage pumping stations which the city itself maintains, the entire shore front of Chicago and its immediate vicinity will be well protected.

At the present time the construction of the north shore channel is progressing very rapidly and will probably be completed and in operation before the end of the present year. This channel takes water from Lake Michigan near Wilmette and discharges it into the north branch of the Chicago River. From the lake front to Sheridan road, a distance of about 400 ft., the water will flow by gravity. Here a viaduct carries this road across the canal channel, and built as a part of the viaduct itself and beneath it is the pumping station and a lock. This lock will be used for allowing the barges and tugs employed in keeping the channel free to go into the lake for discharging their loads. The bridge proper will consist of a steel framework, faced with Bedford limestone, thus giving the structure the appearance of a stone bridge. It will have a paved roadway 46 ft. wide and two sidewalks, each 8 ft. wide, with ornamental stone railings.

Beneath the center span of the bridge will be located the pumping station, containing motor and transformer rooms, each measuring 29 x 45 ft. Four horizontal screw pumps, with an individual capacity of 15,000 cu. ft. per minute against a head of 3 ft. when running at a speed of 75 rev. per min., will be installed. Fig. 1 shows the suction side of one of these large pumping units, while Fig. 2 illustrates the discharge side as the pump appeared in the builder's shop. Each of these pumps will be driven by a 150-hp. three-phase 60-cycle 2300-volt induction motor. The runners will be located on the easterly side of the buildings, with the shafts extending horizontally into the motor room. These pumps are similar in construction to others of the same character installed by the Allis-Chalmers Company in the other two stations of the district.

The Taylor Fixed Focus Pyrometer

A New Instrument for Long Distance Work

The power of heat to produce destruction or change in the nature of materials has been recognized for a long time, and in these later days it has been increasingly used as a stage in innumerable processes. In the consideration of the measurement and control of the heat to be applied to any process this activity becomes a source of trouble. Heat is applied to produce change in the product under treatment and yet the device which is to measure that heat must be proof against its ill effects, otherwise the measurements will be unreliable. These facts have presented serious obstacles to the application of pyrometers to processes where the temperatures are very high, and the chemical activity of the furnace gases or of the materials under treatment as well as inaccessibility have also increased the limitations. This has made necessary the designing of a pyrometer that will be able to work at a distance with many obvious advantages. The Taylor Instrument Companies, Rochester, N. Y., have developed a fixed focus pyrometer for quickly reading high temperatures at a distance without focusing. Fig. 1 shows the standard portable outfit, Fig. 2 shows the instrument in use and Fig. 3 is a diagram of the receiving tube.

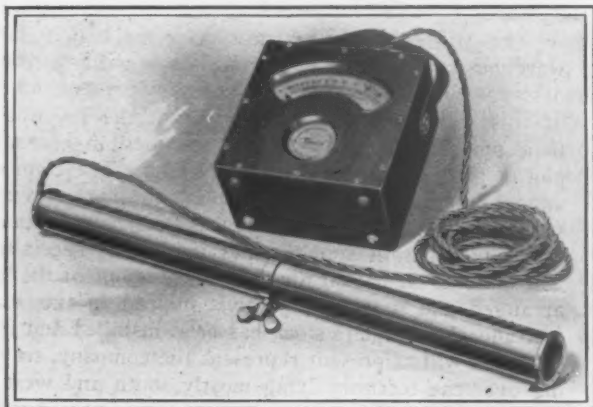


Fig. 1.—Standard Portable Fixed Focus Pyrometer, Made by the Taylor Instrument Companies, Rochester, N. Y.

If the heat given out by any hot body is concentrated on any device that is sensitive to heat there will be an indication by that device of the temperature of the hot body under examination. The most convenient one for this purpose is a thermo-couple, because it can be made very small to get a concentration of the heat and also because it can be connected to an indicator at a distance. The thermo-couple is composed of two very small wires of different alloys joined together at one end, the free ends being connected to a suitable electrical circuit including a flexible cable and an indicating milli-voltmeter. The radiant heat is concentrated upon the common junction of the two alloys and heats this point above the temperature of the junctions of these two alloys to the rest of the circuit, with the result that an electromotive force is set up which is proportional to the temperature of the body radiating the heat. This sensitive thermo-couple is entirely contained within the tube of the pyrometer, and the indications of the instrument are independent of the general air temperature or that of the tube itself.

In Fig. 3, which is a diagrammatic section of the receiving tube $e f$ is a diaphragm, while c , at the opposite end, is a concave mirror. The heat radiated from any hot body, such as $a b$, enters the opening in the diaphragm and a fixed proportion of it strikes the mirror. This is reflected by the mirror and collected at a focus, d , where the thermo-couple junction is located. The amount of heat radiated to the mirror is entirely independent of the size of the body, as will be apparent



Fig. 2.—The Fixed Focus Pyrometer in Use.

by an inspection of Fig. 3. Any extension of the hot body beyond the limit indicated by the dotted lines passing through the points $e f$ would only be able to radiate heat on the walls of the tube, and these are made nonreflecting. The waves of heat passing through these points at the edges of the diaphragm define a cone whose apex is at g . For any given hot body the maximum working distance will be a fixed multiple of the diameter or other smaller dimension of the body. Any working distance less than this maximum will result in the outer edges of the body being out of measurement, and in all cases the action will be just the same as if the hot body were actually at the diaphragm. The instrument is designed so that the mirror throws on the thermo-couple junction at d a focused image of the aperture $e f$. This fact also supplies the reason for the name, fixed focus. The position of the apex is shown on the outside of the tube by a metal ring, shown in both Figs. 1 and 2, which carries the fixing stud and nut. For the sake of convenience the proportions of the hot body to the working distance are not drawn to scale in the diagram, but in the standard tube the actual proportion is 10 to 1.

In use the indicator is laid on the ground or any convenient support, and the tube is pointed centrally at the peep-hole or door of the furnace whose temperature it is desired to measure and the result read on the indicator dial. The central ring on the tube must not be farther away from the opening of the furnace than 10 times the smallest measurement of the actual opening. That is, if the opening is a furnace door, whose diameter or smallest measurement is 12 in., the center ring of the tube must be within 120 in. of the inside edge of the door. Likewise, if the opening is a peep-hole 3 in. in diameter the working distance from its inside edge to the center ring on the tube must not exceed 30 in. It is not necessary to make accurate measurements of the working distance, as any distance less than the above limit will give correct indications. With this pyrometer the temperatures of a whole battery of furnaces can be rapidly checked, or, on the other hand, the instrument may be permanently fixed to give continuous indications from any one furnace. In the latter case the receiving tube will be mounted on a bracket and pointed into the furnace, while the indicator may be conveniently placed on a shelf or table where the operator can read the temperature from time to time.

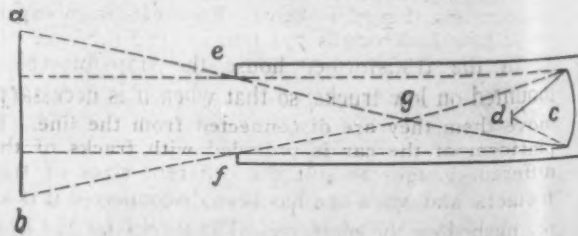


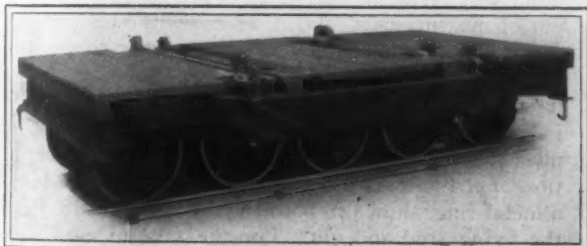
Fig. 3.—Diagram of Receiving Tube.

The temperature of that part of the furnace at which the tube is pointed will be automatically shown, so that it can be used to explore a furnace or any hot body in order to find out the variation in temperature. If for any reason it is inadvisable to have a permanent opening in the furnace, a fire clay tube closed at its inner end can be inserted and the receiving tube pointed into this. For the quickest measurements V-brackets may be placed in front of the openings to each furnace and a tube placed in these brackets, while the indicator is held on the arm. A portable collapsible tripod is applied when desired, which is arranged with an angle plate. The stud and wing nut fitted to the tube provide a means of fixing the tube to the tripod and allow of placing it at desired angle.

The indicator scale is divided boldly so that it can be read in a poor light, and is so graduated that at the points where the instruments are customarily used reading can be easily made to 5 degrees, or within one-quarter of 1 per cent., where the temperature is 2000 degrees. The moving parts are of robust construction to withstand the rough usage met with in industrial work, and the instrument does not need to be accurately leveled in use or clamped when carrying.

The Koppel Steel Transformer Car

It is frequently necessary to move large transformers from one part of the power station to another or from the transformer room to the repair shop, so that the workman can do the necessary work without com-



A Steel Platform Car for Transporting Transformers, Built by the Orenstein-Arthur Koppel Company, Pittsburgh, Pa.

ing in contact with live wires carrying high potential currents. Where this work has to be done without the aid of a crane, it is a somewhat difficult operation. For doing this work satisfactorily in the power house of the Rand diamond mines in South Africa, the Orenstein-Arthur Koppel Company, Pittsburgh, Pa., has designed and built a special type of steel platform car which is shown in the accompanying illustration. Several large three-phase 5000-kw. transformers weighing 88 tons each, and also a number of smaller ones whose weight varies from 13 to 50 tons, are installed in this power house, and the work for which these cars were built was to handle them when it is necessary to remove them from the transformer house to a repair shop located some distance away for occasional repairs.

Steel is employed throughout in the construction of these cars except for the wooden platform on top. As will be noticed from the illustration, there are five axles, and the wheels on the three inner ones are without flanges, so that the car may be made to run easily around the curves in the track, which have a radius of about 600 ft. and a gauge of 3 ft. 6 in. All five axles are equipped with roller bearings. The frame of the car consists of steel I-beams. Each car has a capacity of 90 tons and weighs $7\frac{1}{2}$ tons.

In the transformer house the transformers are mounted on low trucks, so that when it is necessary to move them they are disconnected from the line. The platform of the car is provided with tracks of three different gauges to suit the different sizes of transformers, and when one has been disconnected it is simply pushed on the platform. The tracks for the heavy-

est transformers consist of ordinary rails bolted to the steel car frame, while those for the lightest are of steel channel irons covered with plates, as the wheels of the smaller trucks are without flanges. The loading of the transformers on the car from the side naturally has a tendency to tip the car, but this is checked by adjustable screw supports which are lowered and raised by worm gears operated from the end of the car. This type of construction is necessary because of the great amount of force required to release the supports after the transformer is placed on the car. During the loading process, these supports are lowered and rest on brickwork pillars in the floor of the transformer building.

While the transformers are being transported they are secured in position by special catches which lock the wheels on the transformer trucks to the rails of the car. Hooks in the end frames of the car are connected to links set in the brickwork of the building and hold the car stationary while it is being loaded. The use of this car, when desired for purposes other than that for which it was designed, is made easy by the wooden platform. Great strength with comparatively light weight is secured by the type of construction employed, and the roller bearings with which the axles are provided enable it to be propelled with a minimum expenditure of power.

A New Kansas Iron Store

The Massey Iron Company has completed its large warehouse at Wichita, Kan., and is now ready for business. A circular issued by the company presents a view of this warehouse, which shows that the building is handsome and substantial. It occupies an extensive plot of ground and is three stories high. The company announces that it will do a jobbing business in iron, steel, heavy hardware, blacksmiths' and carriage makers' supplies, mill supplies and implement specialties. The claim is made that the warehouse is one of the best arranged and most thoroughly equipped in this class of trade. A complete stock has been installed and four salesmen will at present represent the company, traveling over the territory lying mostly south and west of Wichita. John Massey, who has engaged in this branch of business for twenty years, is president and manager; Harry D. Howard, for several years buyer and stock-keeper for a heavy hardware house, is vice-president; Ambrose Bowdish, an experienced bookkeeper, is secretary, having charge of the books, credits and collections; G. L. Moore is treasurer. In addition to the jobbing business the company will manufacture buggy and carriage tops, automobile tops and trimmings, cushion work, poles, shafts, &c. Manufacturers' catalogues are desired.

An Extensive Scale Factory.—The Angldile Computing Scale Company, Elkhart, Ind., has plans prepared for a new factory, 120 x 509 ft., with wings of 50 ft., with a space of 20 ft. between them for light and ventilation. An important feature of these buildings will be the heating and ventilating systems. Hot air will be supplied from an indirect system, by which the air, brought from outside, will first be washed and then carried through a coil of steam pipes. A forcing system will send the warmed air the length of the wings, through a large pipe carried beneath the roof. From this main pipe laterals will be carried to the sides of the room at short intervals, and from them the air will be discharged in such volume as the workmen may desire. It is possible with this system to change the air in the entire shop every 10 minutes. During the summer season this same system will be converted into a refrigerating plant; thus a temperature several degrees below that to be found outside will be maintained. Details of the equipment to be installed have not yet been decided upon.

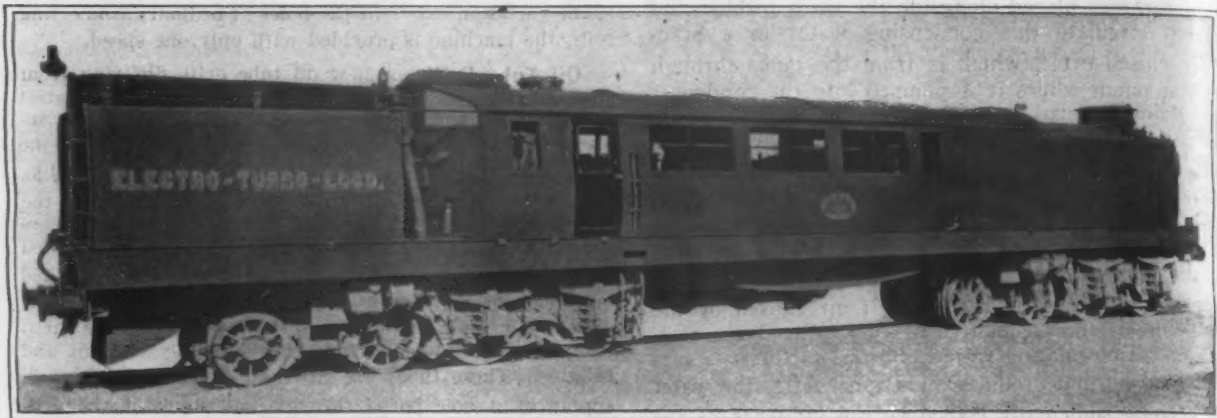
The Reid-Ramsey Electric Locomotive

A Combination of the Steam Turbine with the Electric Motor

In *The Iron Age* of December 30, 1909, preliminary announcement was made of the construction of a steam turbine electric locomotive at the works of the

tric locomotive built in 1894, whose trial trip was described in *The Iron Age* June 7 of that year. Up to the present time that locomotive represented the most notable attempt made to introduce independent self-generating electric units for operation over existing steam railroad lines without requiring any installation of electric equipment on the right of way itself.

A boiler of the ordinary locomotive type fitted with a superheater is employed to generate steam, the sup-

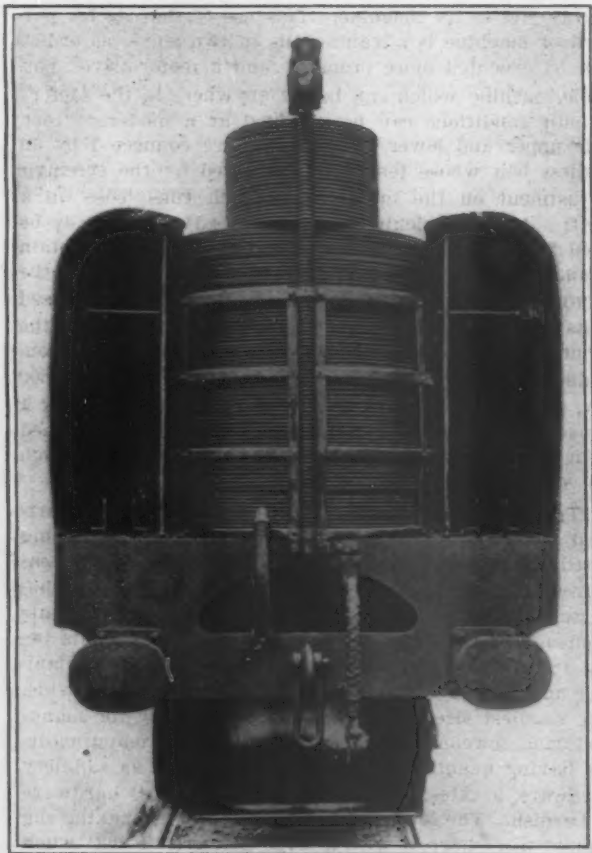


Courtesy *Railway Age Gazette*, New York.

Fig. 1.—The Reid-Ramsey Steam Turbine Electric Locomotive. Built by the North British Locomotive Company, Ltd., Glasgow, Scotland.

North British Locomotive Company, Glasgow, Scotland. This locomotive has been completed and made its preliminary trial on the main lines of the Caledonian and the North British Railways. The illustrations, which are reproduced through the courtesy of the *Railway Age Gazette*, New York City, give a good idea of the locomotive and its construction. Fig. 1 is

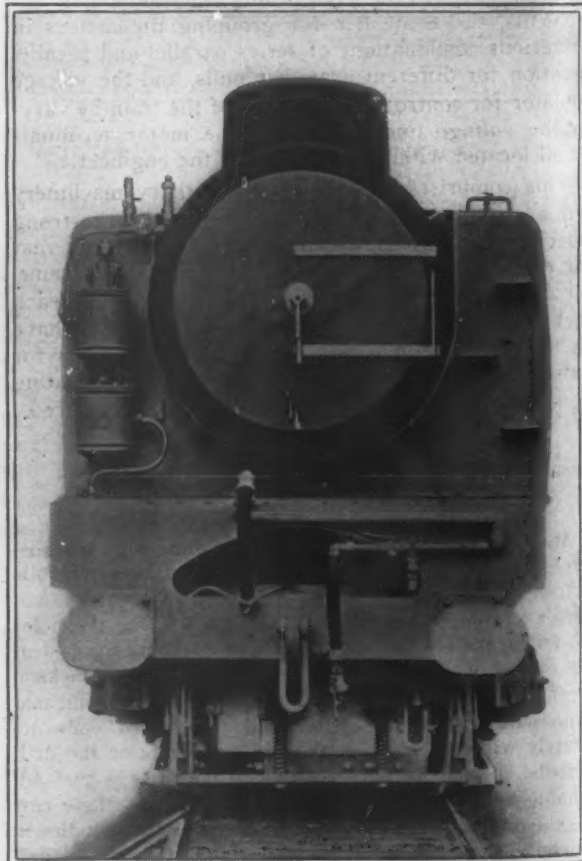
plies of coal and water being carried in bunkers and tanks located on either side of the boiler. After being generated in the boiler the steam passes to an impulse type of turbine operating at a speed of 3000 rev. per min. A direct current variable voltage dynamo which is directly connected to the turbine supplies energy at a potential varying from 200 to 600 volts to four series-



Courtesy *Railway Age Gazette*, New York.

Fig. 2.—The Front End of the Locomotive.

a view of the locomotive, while Figs. 2 and 3 illustrate the front and rear ends, respectively. This new engine is a development of the idea embodied in the construction of the Heilmann steam elec-



Courtesy *Railway Age Gazette*, New York.

Fig. 3.—The Rear End of the Locomotive.

wound railway motors whose armatures are built on the four driving axles of the locomotive. The exhaust from the turbines passes into an injector condenser and in company with the circulating water of the condens-

ing system is eventually delivered to the hot well. Unlike the reciprocating engines the turbine requires no internal lubrication, which keeps the water of condensation free from oil and permits it to be returned to the boiler directly from the hot well by a feed pump. The water employed in the production of steam is, therefore, returned to the boiler over and over again, and the supply of water carried in the water tanks is available for use as circulating water for condensing purposes. Small centrifugal pumps driven by auxiliary steam turbines placed alongside the main turbine and dynamo circulate this condensing water in a practically closed cycle, which is from the tanks through the first pump where it is pumped into the condenser and becomes heated by the operation of condensing the exhaust. From the condenser it passes to the hot well, from which it is pumped by a second pump to the cooler on the front end of the locomotive. This cooler, which is shown in Fig. 2, is of the same general type as that employed in automobile construction or for cooling the jacket water of gas engines. By locating the cooler in this position the blast of air caused by the movement of the locomotive is fully utilized for cooling the hot circulating water, and this air blast is supplemented by that produced by a fan. After the water has become sufficiently cooled by the influence of the air it is returned to the supply tanks, thus completing the cycle.

Condensing the exhaust steam obviously deprives the boiler of the usual exhaust blast which induces the draft through the fire box and boiler tubes. A small turbine driven fan producing forced draft supplies the deficiency. This fan is the one mentioned in the previous paragraph, and is placed within the cooler so that it will deliver heated air to the boiler fire box, and at the same time assist the current of air through the cooler. The electrical equipment which includes a small switchboard with recording and indicating instruments, the controller for grouping the motors in the various combinations of series parallel and parallel operation for different draw bar pulls, and the voltage regulator for controlling the speed of the train by varying the voltage impressed upon the motor terminals are all located within easy reach of the engineer.

This comprises the main and auxiliary machinery of this locomotive, all of which is mounted on a strong underframe. Two eight-wheel articulated trucks that will easily negotiate curves support the underframe, and the driving axles are the pair at the right of each truck in Fig. 1. Although the results of the tests have not been made public, it is expected that a basis for comparison with the performances of reciprocating engines for express passenger service will be secured.

New Tools and Appliances

Machine for Drilling and Facing Connecting Rods.—

One of the costly operations in manufacturing automobile engines is making the connecting rods, as accuracy and perfect alignment are required both in drilling the holes and facing the ends. With a view to reducing the cost of this operation the Hoefer Mfg. Company, 118 Jackson street, Freeport, Ill., has designed and built a special machine which drills the holes and faces both ends accurately without changing the rod in the jig or the drill or tools. The principal part of the machine is two adjustable heads gibbed to a solid bed. One of these carries the drilling spindles and the other has the spindles in which the facing tools for the ends of the rods are placed. The pieces are placed in a jig that is clamped firmly during the operation of drilling and facing, and after the rod has been set an eccentric lever on two projecting arms is locked, thus giving additional support to the rod for high speed drilling. The small end of the connecting rod is drilled first, and while this is being done the sides of the large end are faced concentric with the holes. When these operations are completed the lever is opened and

the jig swung through an arc of 180 degrees against an adjustable stop. The ends of the rod are again clamped by the eccentric lever and the large end is drilled while the operator faces the small end. All the spindles are in perfect alignment with the jig carrying the connecting rod, and thus absolute accuracy is assured. An adjustable positive stop of hardened steel is placed in each end of the trunnion jig for the facing tools, and each end of the rod as it is swung from one position to another carries with it its own stops, so that all dimensions are duplicated when once the proper setting is made. As only a slight variation exists in the holes of ordinary connecting rods, the machine is provided with only one speed.

Oil Tube Drill.—A new oil tube drill, differing from those of this type formerly manufactured in having steel tubes for conveying the lubricant to the drill point instead of brass ones, has been recently placed on the market by the Standard Tool Company, Cleveland, Ohio. The increased speed of high-speed steel drills and the heavy cuts taken in refractory metals proved too severe for the brass tubes as they were readily cut and pulled out of place. The steel tubes, however, showed a marked improvement and after a thorough and exhaustive test under the most severe conditions the oil tube drill equipped with them has proved thoroughly efficient and reliable. These tubes are fitted to connect with the oil supply by a hole bored through the shank of the drill and the oil is forced through this hole and flows through the steel tubes, thus giving a constant supply to the cutting edges, which keeps them cool and forces out the chips. It is stated that the use of this type of drill will be found very satisfactory where deep holes are to be bored in steel or wrought iron and they can also be used to advantage in screw machines or in any tool fitted with means for supplying the lubricant. The hole in the shank can be threaded for a pipe connection if desired.

Motor Driven Screw Machines.—Garvin Machine Company, New York City, is equipping its standard No. 1 screw machine with a motor drive, the motor being mounted on a bracket at the rear so as to form an integral part of the machine. This use of the regular pattern of machine is advantageous in two ways, as orders can be executed more promptly and a motor-driven portable machine which can be set anywhere in the factory to suit conditions can be obtained at a moderate cost. The upper and lower cone pulleys are connected by an endless belt whose tension is regulated by the eccentric adjustment on the upper cone which runs loose on a shaft. As it is quickly operated this adjustment may be used for slackening the belt prior to shifting it to obtain changes in the speed. The upper cone pulley and the motor armature are connected by straight and crossed belts controlled by a shipper handle projecting from the front of the machine which makes the control very convenient for the operator. A $\frac{1}{2}$ -hp. motor running 1600 rev. per min. is used to drive the machine, which has a capacity for stock $\frac{5}{8}$ in. in diameter, and is equipped with an automatic wire feed for feeding the stock through the spindle.

Tumbling Barrel.—The Abbott Ball Company, Hartford, Conn., is building a tumbling barrel for burnishing small metal goods by the use of steel balls. These machines are built in three sizes with any number of compartments from one to four, inclusive; the inside measurements of the different sizes of the compartments being 18 in. in diameter, with a 5-in. face, 24 in. in diameter and 7-in. face and 30 in. in diameter and 8 in. wide. The smallest size is designed more especially for manufacturing jewelers' use and the largest for manufacturers having quantities of such articles, such as saddlery hardware, buckles, hose supporters and cabinet hardware to burnish. The idea of the manufacturer in making the compartment narrow with a large diameter is that when the barrel is loaded with work and the burnishing balls, considerable pressure is exerted upon everything at the bottom of the load which increases the friction and gives a more rapid burnishing effect, as there is a long sliding space for the balls to slide over and under in and out of the work and at the same time any impact which tends to dent the work rather than burnish it is said to be avoided.

CURRENT METAL PRICES.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought are given elsewhere in our weekly market report.

IRON AND STEEL— Bar Iron from store—	
Refined Iron:	
1 to 1½ in. round and square.....	¢ 1.90
1½ to 4 in. x ½ to 1 in.	¢ 2.10
1½ to 4 in. x ¼ to 5-16.	¢ 2.10
Rods—¾ and 1-16 round and square.	¢ 2.10
Angles:	
3 in. x ¼ in. and larger.	¢ 2.10
3 in. x 5-16 in. and ¾ in.	¢ 2.30
1½ to 2½ in. x ¼ in.	¢ 2.30
1½ to 2½ in. x 3-16 in. and thicker.	¢ 2.10
1 to 1½ in. x 3-16 in.	¢ 2.30
1 to 1½ in. x ½ in.	¢ 2.40
¾ x ¾ in.	¢ 2.30
¾ x 1 in.	¢ 2.50
½ x ¾ in.	¢ 2.30
½ x 1 in.	¢ 2.50
Tees:	
1 in.	¢ 2.65
1½ in.	¢ 2.45
1½ to 2½ x ¼ in.	¢ 2.15
1½ to 2½ x 3-16 in.	¢ 2.35
3 in. and larger.	¢ 2.15
Beams:	
Channels, 3 in. and larger.	¢ 2.10
Hands—1½ to 6 x 3-16 to No. 8.	¢ 2.30
"Burden's Best" Iron, base price.	¢ 3.15
Burden's "H. B. & S." Iron, base price.	¢ 2.95
Norway Bars.	¢ 3.60

Merchant Steel from Store—	
Bessemer Machinery.	per lb. 1.90
Toe Calk, Tire and Sleigh Shoe.	2.50 @ 3.00
Best Cast Steel, base price in small lots.	75

Sheets from Store—	
Black	
One Pass, C.R.	R. G. Cleaned.
Soft Steel.	
No. 16.	¢ 2.90
Nos. 18 to 21.	¢ 3.10
No. 22 and 24.	¢ 3.05
No. 26.	¢ 3.10
No. 28.	¢ 3.20

Russia, Planished, &c.	
Genuine Russia, according to assort- ment.	¢ 12 @ 14½
Patent Planished, W. Dewees Wood.	¢ A, 10½; B, 9¢ net.
Galvanized.	
Nos. 14 to 16.	¢ 3.20
Nos. 22 to 24.	¢ 3.55
No. 26.	¢ 3.75
No. 28.	¢ 4.10
No. 30 and lighter 36 inches wide, 25¢ higher.	

Genuine Iron Sheets— Galvanized.	
Nos. 22 and 24.	¢ 5.55
No. 26.	¢ 6.25
No. 28.	¢ 7.25

Corrugated Roofing—	
2½ in. corrugated.	Painted Galv.
No. 24.	100 sq. ft. \$3.55 4.90
No. 26.	160 sq. ft. 2.95 4.30
No. 28.	100 sq. ft. 2.60 3.75

Tin Plates—	
American Charcoal Plates (per box.)	
"A. A. A." Charcoal:	
IC, 14 x 20.	\$6.35
IX, 14 x 20.	\$7.00
A. Charcoal:	
IC, 14 x 20.	\$5.40
IX, 14 x 20.	6.50

American Coke Plates—Bessemer—	
IC, 14 x 20.	\$4.40
IX, 14 x 20.	5.40

American Terne Plates—	
IC, 20 x 28 with an 8 lb. coating.	\$8.50
IX, 20 x 28 with an 8 lb. coating.	10.50

Seamless Brass Tubes—	
List November 13, 1908.	Base price 18¢

Brass Tubes, Iron Pipe Sizes—	
List November 13, 1908.	Base price 18¢

Copper Tubes—	
List November 13, 1908.	Base price 22¢

Brazed Brass Tubes—	
List August 1, 1908.	19½¢

High Brass Rods—	
List August 1, 1908.	14½¢

Roll and Sheet Brass—	
List August 1, 1908.	14½¢

Brass Wire—	
List August 1, 1908.	14½¢

Copper Wire—	
Base Price,	Carload lots mill 14 ¢

Copper Sheets—	
Sheet Copper Hot Rolled, 16 oz (quantity lots) ½ ¢ 8 ¢	
Sheet Copper Cold Rolled, 1¢ ¢ advance over Hot Rolled.	
Sheet Copper Polished 20 in. wide and under, 1¢ ¢ square foot	
Sheet Copper Polished over 20 in. wide, 2¢ ¢ square foot.	
Planished Copper, 1¢ ¢ square foot more than Polished.	

METALS— Tin—	
Straits Pig.	¢ 35 @ 35½

Copper—	
Lake Ingot.	¢ 14½ @ 15 ¢
Electrolytic.	¢ 14½ @ 15 ¢
Castings.	¢ 14½ @ 15 ¢

Spelter—	
Western.	¢ 6 @ 6½

Zinc.	
No. 9, base, casks.	¢ 8 ¢ | Open.

Lead.	
American Pig.	¢ 5 ¢ 5½
Bar.	¢ 5 ¢ 5½

Soldier.	
½ & ¾, guaranteed.	¢ 22 @ 22½
No. 1.	¢ 22 @ 22½
Refined.	¢ 17½ @ 18 ¢

Prices of Soldier indicated by private brand vary according to composition.

Antimony—	
Cookson.	¢ 12 @ 12½
Halletts.	¢ 12 @ 12½
Other Brands.	¢ 12 @ 12½

Bismuth—	
Per. lb.	\$3.00 @ 3.25

Aluminum—	
No. 1 Aluminum (guaranteed over 99% pure), in mass for remelting.	Base Price 1¢
Rods & Wire.	Base Price 1¢
Sheets.	Base Price 1¢

Old Metals.	
Dealers' Purchasing Prices Paid in New York	

Copper, Heavy cut and crucible.	
Copper, Heavy and Wire.	¢ 16.75 @ 17 ¢
Copper, Light and Bottoms.	¢ 16.50 @ 16.75
Brass, Heavy.	¢ 9.50 @ 9.75
Brass, Light.	¢ 7.25 @ 7.50
Heavy Machine Composition.	¢ 5.75 @ 6 ¢
Clean Brass Turnings.	¢ 7.00 @ 7.25
Composition Turnings.	¢ 8.25 @ 8.50
Lead, Heavy.	¢ 6 ¢ 6.25
Lead, Tea.	¢ 6 ¢ 6.25
Zinc Scrap.	¢ 6 ¢ 6.25



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